RAILROAD GAZETTE

FRIDAY, MAY 13, 1881.

New Car-Wheel Borer.

This machine, represented by the engraving herewith, is one of a new design recently completed at the Machine-Tool Works in Philadelphia, and is now in use at the well-known works of Messrs. A. Whitney & Son in that city. It is intended to bore wheels up to 42 in. diameter. The machine has been designed by Mr. F. B. Miles, the engineer and manager of the Machine-Tool Works, in conjunction with Mr. L. R. Faught, Superintendent for Messrs. Whitney & Sons.

The table of the machine, upon which the wheel is chucked, has its bearings arranged in such a manner as to secure it not only against downward pressure, but also against side strains and all vibration. The train of gearing by which it is revolved is so powerful that even when the boring tool is taking the heaviest cut there is no perceptible jar or tremor. The boring spindle is of large diameter and is carried and guided in adjustable conical bushings which hold it firmly. It can be operated as required either by hand or by automatic feed gear with six changes. Mr. Faught's improved boring tools, which are especially adapted to these machines, are used with them, and they increase very materially the rapidity of the work done.

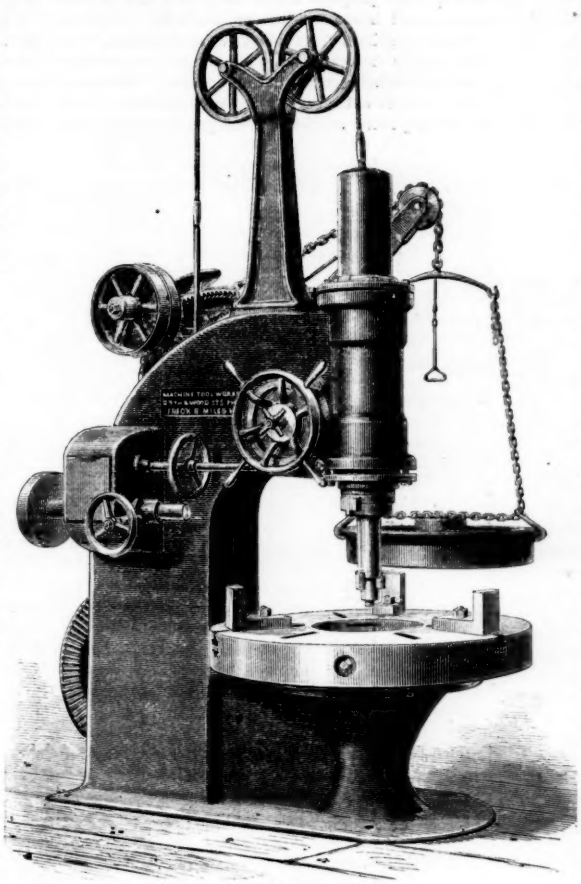
The wheels are handled very rapidly by an exceedingly simple and efficient power crane, shown behind the machine, which is operated by pulleys belted from the line shaft, and is so perfectly under the control of the workman that his exertions are limited to simply hitching on to the wheel and pulling the cord which regulates the movements of the crane.

The following report of the time consumed in boring a wheel has been sent us, and indicates a very remarkable performance:

Roughing cut through in	2 minutes	0 seconds.
Finishing " " "	0 "	55 "
Snouldering the hub "	0 "	10 "
Chamfering the hole "	0 "	5 "
Total	3 minutes	10 seconds.

The whole time consumed by one man in taking up a wheel boring and replacing it on the floor is five minutes. This includes chucking, releasing, etc., as well as making three changes of cutters. It is expected that this time will be still further reduced until the workman can arrange a wheel every four minutes during a day of ten hours.

The Machine-Tool Works are at the corner of Twenty-fourth and Wood streets, Philadelphia, where any other information may be obtained in relation to these new tools.



NEW CAR-WHEEL BORER.

By the Machine Tool Works, Philadelphia.

Frederick B. Miles, Engineer.

Contributions.

The Old Camden & Amboy Fish-plates.

MIDDLETOWN, ORANGE CO., N. Y., April 2, 1881.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of 15th inst., in commenting on the claim of W. Brown as originator of the fish-plate, you refer to its earlier use on the Camden & Amboy Railroad. In 1846 and 1847 I had charge of a section of repairs on that road, and the great proportion of the rails then in use had riveted fish-plates at the joints. I do not know how long they had been in use, but they were so much worn that a considerable part of them were replaced by new ones during the two years I speak of.

By the way, the new rails came from Cooper & Hewitt's Trenton Mills, Trenton, N. J., and must have been about the first turned out of that establishment. J. REEVE.

Chemistry in Rail Inspection.

No. 19 Great George St., Westminster, S. W.,
LONDON, April 28, 1881.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of 15th April, 1881, you have done me the favor to quote in your leading article on "Steel" the following sentence from my paper on "Rail Specifications and Rail Inspections in Europe:"

"I have come to the conclusion that the simple falling test is all that is necessary, and in every respect sufficient. But a practical test of very great value, which my inspectors have to superintend each day during the make, is that in which the maker himself, for his own satisfaction, tests every blow mechanically by having a sample ingot hammered out to a bar 1 in. by ½ in., which should when cold stand bending at least to right angles."

This is quite correct, but the remark tends to imply that I should be inclined to underrate the value of chemistry in steel testing, and in order to correct this impression I wish to quote other sentences which appear in my paper, for instance:

"Should the steel break, the cast must not be used, and the blowing metal must be changed immediately, so as to produce a superior material. In this case a chemical analysis for carbon, silicon and phosphorus is made, in order to discover the cause of the metal being too hard or too brittle."

On a following page, under the head of "American Engineer's Specification," is given the description of the analysis made by our chemist in execution of Dr. Dudley's formula for rail inspection, which, however, in my opinion, is not the right one; but if the railway companies should insist upon adopting this specification, I could see it carried out and as no one can value the assistance of chemistry in steel-making more than myself, having started it eleven years ago, I trust we shall ultimately arrive at the best specification for steel rails, "if we let the chemist *help* us, but not be our master and dictator."

This will show my appreciation of chemistry at the time the paper was written, and previous to that you will see by the inclosed circular* that I already made arrangements in my rail inspection to test the rails chemically as well as mechanically.

I may even further add that I have been working my chemical laboratory here, in conjunction with mechanical testing at the works, in a systematic way, so as to cause no delay in the dispatching of both blooms and rails; and it has come in very opportunely, as my inspection of blooms for America is becoming considerable. Owing to the advantage of the mechanical and chemical inspection being in the same hands, the delay and disagreement which sometimes arise when two inspectors of the same work is made are thus avoided.

Out of hundreds of analyses made, many of them checked by our best chemical authorities, none have yet deviated essentially in results; and on the whole, it has thrown a remarkably lucid light on the entire subject.

I shall avail myself of the opportunity to explain in more detail my system of applying chemistry rail and bloom inspection, in my reply to the discussion at the Philadelphia meeting, than I can venture to do now; and I need not, therefore, trespass on your space.

Meanwhile, in reference to your excellent article, "Steel," as your quotation from my work might perhaps place me among those who rely on their "practical acquaintance" only, I hope by these few lines to show you that I try in my practice to contribute to the "definite knowledge" of the "feminine iron," viz., steel, by voluntarily testing chemically, as well as mechanically. C. P. SANDBERG.

*The paragraphs of his circular to which Mr. Sandberg refers are as follows:

"In consequence of the great changes that have lately taken place in the processes for the manufacture of steel rails, I have found it desirable, in order to do justice to my clients, to secure the assistance of a metallurgical engineer *to test the rails chemically as well as mechanically.*

"I have therefore attached to my staff, Mr. M. Troilius, a Swede (a pupil of Professor Eggertz), who is fully competent for this work."—EDITOR.

The New General Passenger Depot in Chicago.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The General Passenger Depot at Chicago was completed and occupied on the 4th of April last. The old frame station and sheds which had served the Fort Wayne and Alton roads so long were demolished less than one year before, and ground broken for the new work on the 12th of April, 1880.

The writer having long known the old depot, and carefully noted the progress of the improvements, believes that a description will be of interest to the readers of this journal.

The grounds of the Pittsburgh, Fort Wayne & Chicago Railway, operated by the Pennsylvania Company, front on the east side of Canal street, between Madison and Van Buren streets, a length of 1,850 ft.; the South Branch of the Chicago River, which is from 300 to 400 ft. from Canal street, flows along the east line of the property. The depot grounds are crossed at the centre by Adams street, the city traffic crossing the grounds and the river by a bridge, which is high enough above the rails to clear the locomotives and cars. The track level is entirely below the streets, and but seven feet above the water surface of the river. Van Buren and Madison streets both cross the tracks by viaducts, at the south and north ends of the ground respectively.

The fee of the property is in the Pittsburgh, Fort Wayne & Chicago Railway Company, the Pennsylvania Company operating. The latter company entered into a contract with the four foreign roads for the joint *use* of the depot without in any way disturbing the title or leasehold.

The principal freight warehouse of the Pennsylvania Company is situated along the east side of the property parallel with and about 180 ft. distant from Canal street, with a driveway along the river, approached by inclines from Madison and Van Buren streets. This building is of brick, about 700 ft. long by 60 ft. wide; all but 80 ft. lies north of Adams street viaduct, which divides the building into two parts. It is believed that the company will extend these buildings during the year southward toward Van Buren street. The short section was moved back toward the river about 20 ft. last year, to admit more tracks in front.

In order to give a clearer idea of the locality a diagram is given.

The depot is to be used by the following railroad companies:

The Pittsburgh, Fort Wayne & Chicago, operated by the Pennsylvania Company

The Chicago, Burlington & Quincy Railroad.

The Chicago & Alton Railroad.

The Chicago, Milwaukee & St. Paul Railway, and the Pittsburgh, Cincinnati & St. Louis Railway.

The trains of the first three companies enter and leave the depot from the south, the other two from the north end.

The grounds occupied by the depot tracks were graded by excavating to two feet below the rail. New steel rail tracks were laid on a solid foundation of broken lime stone.

The train house is 1,100 ft. long, with open sides except at the buildings to which it is attached; the width is 100 ft.; 700 ft. lies north and 400 ft. south of Adams street. The framework is supported by iron columns at intervals of 25 ft.; these columns rest on blocks of masonry and are bolted to a heavy footing stone. The entire shed is of iron and glass, except the wooden roof sheathing and the small wooden rafters to which it is nailed. The roof is of the best charcoal tin manufactured. Platforms are laid at the level of the top of rail. Provision is made for drainage of roof and surface water, and for lighting the sheds at night. At one time it was thought that the electric light would be used, but gas has been introduced. Doubtless the electric light will ultimately be used; it is so suitable to the place that it was probably omitted only in the belief that great improvements in electric lighting would be made shortly. The system of gas lighting is as perfect as could be devised; three lines of lights extend the full length of sheds; these lines are divided at the centre so that any one or all of the six may be lighted and extinguished instantaneously by keys, at one convenient point. Small "tell-tale" burners, supplied by a small main, are kept constantly lighted; by turning on the gas to the main pipes the lamps are lighted. The tell-tales consume but little gas, and have proved efficient. Large "Dyott" lamps are used throughout the train house.

The depot buildings are three in number, all fronting on Canal street. The principal one—the passenger depot proper—is 200 ft. front by 58 ft. in depth. The other two front 150 ft. each on Canal street and are 25 ft. deep. All the buildings are three stories in height above the track level—two stories only above the street. They are all built of brick, with Warrensburg stone for trimmings. The foundations are of random coursed work on squared-up footings of Joliet limestone. The faces of all walls are of Philadelphia pressed brick. This work has received many favorable criticisms on account of the exceptional uniformity of color and regularity of laying such a large number. Black mortar was used throughout the face work. Over 425,000 pressed brick and 2,250,000 common Milwaukee and Chicago brick were used in the work. At each end of the main building granite stairways lead down to the track level; the walls along these stairways and the rear first story walls are faced with enamelled brick in pleasing designs. This is to avoid the unsightly discoloration of pressed brick caused by persons rubbing or leaning against it. All exposed corners are protected by iron guards built into the walls.

The moderate depth which could be given to the building led to the supporting of the main rear wall on iron columns. The rear first story wall is about 18 ft. nearer to the street than the main rear wall of the building; this gives a spacious porch which is inclosed by an iron railing, with gates to train house for passengers.

The roofs of all the buildings are covered with Peach-bottom slate. The tinning of gutters, valleys and flashings are of the best "IX." dipped charcoal plate. The same tin is used for the roof of the "porches" or verandahs on Canal street, which are iron framings extending from the curb to the walls, the whole length of the three buildings and crossing Adams street by special construction in keeping with the other work. The cornice and open work patterns of iron forming a frieze below it combine to give a finish to this

part of the work, while the porches themselves are of great utility, affording a complete protection to the sidewalk, so that passengers can enter the depot or train house with comfort and giving shelter to baggage, mails, etc., *in transitu*.

This verandah along Canal street, in front of the buildings, is 580 ft. long and 16 ft. wide. Its importance, as greatly adding to the facilities for handling passengers and baggage, cannot be overestimated. It is conceded by experts to largely increase the working efficiency of the depot.

The "main building" is the principal object of interest, and is well worthy a careful examination. Its general "lay out" is unique in many respects, owing to the peculiar features previously mentioned.

The main entrance is at the centre by three pairs of swinging doors admitting to a "vestibule" about 30 ft. by 40 ft. From the street level one can pass by a flight of a dozen granite steps down to the track floor, or by seven steps on either side of this flight up to the waiting-room floor. There are four pairs of swinging doors from the vestibule to the waiting-room. This vestibule is a striking feature; the frescoed ceiling is some 60 ft. from the floor; the walls are handsomely decorated, and the coat of arms of the states through which the railroads using the depot pass, are artistically painted in the half-circle panels in the walls. A staircase opening off the principal waiting-room leads by one flight to the balcony, inside the main entrance, over the doors, and by each of two flights from the balcony to the third-story hall. This stairway, entirely of wrought and cast-iron, is in design and execution one of the finest in this country; its prominence in the vestibule made its appearance a matter of importance. Instead of being hustled into some obscure corner of the building, its bold introduction and successful treatment render it very effective. The vestibule and granite stairways are wainscotted with handsome marble work; great care has been used here in the harmonious combination of color as well as the selection of the most durable materials. The floor is also of marble The handsome marble newels are surmounted by solid bronze "candelabra" newel lights. The following varieties of marble are among those used in the wainscot: Light and dark Knoxville, Glenn's Falls and Swanton black, Tennessee, Swanton dove, Lyonaise, Bongard, Lisbon, Formosa, Brocatelle and other fine marbles, the most expensive being used in the panels. The floors of vestibule and waiting-rooms are of the best white Italian and Glenn's Falls black, one-fourth black, with black border. The large windows lighting the "rotunda," as this square vestibule has been named, are of handsomely designed stained glass, specially worked out with great skill in drawing and color.

Take it altogether this rotunda is a success and a fitting introduction to the rest of the building. The massive marble and granite work, the ornate staircase, the richness of coloring in the frescoing and stained glass, the beautifully cut plate-glass panels of the doors and the solid wood work of the same form a *tout ensemble* pleasing to the eye, while the evident solidity of the work promises that it will need only an occasional renewing at the painter's hands to keep it bright and charming.

The main waiting-room, which, it will be remembered, is somewhat above the street level, is rectangular, about 54 by 120 ft. The vestibule cuts off about 28 ft. in depth by 38 ft. in width at the centre of the room. The ceiling is 25 ft. high, richly paneled and moulded. The walls and ceilings are frescoed. The wainscoting and other woodwork are of walnut and cherry carved and molded in original and tasteful designs. The windows and glass door panelings are of plate glass, the latter richly cut. The half-circle heads to the windows come above the level of the porch and train-house roofs where they join the main building; these half-circles are all glazed with cathedral and antique stained glass in special patterns, each room having a different treatment. The floor is of marble, laid in cement, on concrete filled over corrugated iron arches, supported in turn by iron beams. These iron arches form the ceiling of the story below, which, it will be remembered, is a trifle above the level of the tracks.

The dining-room is at the north end, on the same floor with waiting-rooms. The ladies' room is at the south end. These rooms are finished in the same style as the waiting-room, but the decoration of the ladies' room is worthy of a longer notice than can be given here. While nothing has been sacrificed in the way of substantial and durable work, the frescoing is remarkably delicate in design and coloring, and combines with the stained glass and other work to make this by far the most elegant waiting-room in the country; at the same time the necessary retiring-rooms have been provided with every comfort experience and care could suggest. In the waiting-rooms are perforated wall seating and settees; the ladies' waiting-room has besides rocking chairs and other conveniences. A "ladies' lunch room" adjoins this room for those who wish some light refreshment without going to the dining-room.

The ticket office projects about 15 ft. into the general waiting-room, and has a window on the ladies' room; its face shows a combination of black walnut, cherry, dark Knoxville marble shelf and six windows on the waiting-room, two of these being at the cut-off corners. The design of all this work is entirely new and very striking. From the main waiting-room a stairway of granite steps leads down to the track level; it is easily approached from the ladies' room. The sides are paneled in fine marbles, while the well-hole is protected by unique and massive railing of solid brass, elaborately ornamented.

Retracing our steps to the vestibule and descending the main stair we find ourselves beneath the overhang of the main building on an asphaltum floor which completely surrounds the buildings and is inclosed by a stone curbing, on which stands the iron railing separating from the tracks and train-house. The rooms on this floor are: the engine room (at the south end), one office, a wash-room and water-closet, a conductor's room, news-room, telegraph office and depot-master's office, smoking and lunch rooms. All these except the engine room have marble floors and are handsomely finished in wood. The glass panels of the doors are finely cut. Neat but prominent lettering indicates the uses of the rooms. The engine room contains two large boilers for the steam-heating apparatus and the pumps for the elevator system. The wash-room and water-closet connect by double doors; a barber shop takes up part of the wash-room. The water-closets are arranged on an entirely new plan with a view to perfect cleanliness and simplicity. The urinals are also simple and we believe unique; they are of marble and dispense with all plumbing except a pipe perforated with holes, into which small nipples are tapped and throw constant small streams against the slabs; the water is received into a marble trough cut out of the solid; thence by suitable simple devices it enters the sewer. The pipe is nickel-plated, as are the brass legs which raise the marble back and side slabs clear of the marble floor of the urinal, which is one step above the marble floor of room. A similar urinal is provided in a small room off the general waiting-room above.

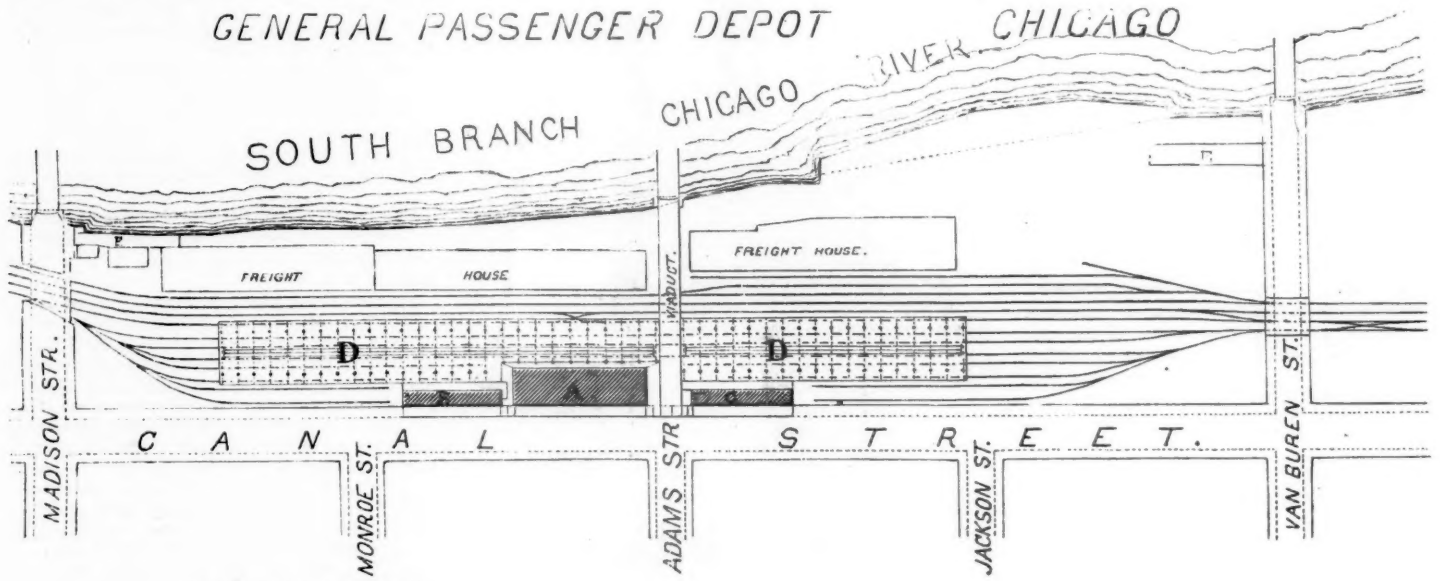
A reference to the first part of this article shows that this floor is at so small an elevation above the ordinary water in the South Branch that a cellar, as ordinarily understood, was not to be thought of. Accordingly a "subway" of masonry was provided along the rear of this story for water, steam and drain pipes; all these are of iron except the smaller water pipes, which are of lead. The drain pipes connect to a private sewer which leads to the river. The plumbing work was designed to be as substantial as possible; marble slabs of wash basins are of more than ordinary dimensions and thickness and of the best marbles obtainable; basins, basin cocks, trimmings and traps are of the best; the water-closets are of one style throughout the buildings; about thirty in all were used, all well ventilated.

The gas fixtures are very elegant and suitable; they were selected especially and prepared in ample time. Nickel and gold finish is used in the main floor, brass in the story below, and bronzed goods in the third story and baggage buildings. The solid bronze newel lights in the rotunda have been spoken of before.

The seating of the waiting-rooms has been carefully studied out; perforated wooden side seating and settees have been adopted, made especially to fit their places. For cleanliness and general comfort, this seating is preferred. No upholstered work has been admitted. A few chairs are in the ladies' apartments.

The hardware of the buildings may be mentioned here. It was selected with care, and is in every way far superior to the ordinary builders' goods so freely used. It is uniform in design; all locks are hand made, with brass works; every lock has two brass keys tabbed to show where they belong. Only bronze and brass are used for door and window trimmings; all is massive and substantial.

The third story of the main building is occupied by offices; the north end has been divided off as a kitchen, as convenient and perfect as could be desired, with ranges, ovens, and all appurtenances complete, including dumb-waiters to the dining-room, just below it, and the lunch-room on the track-level floor. There is also an elevator for heavy work, a stairway for the kitchen from the lowest floor, refrigerators of large size, vaults, store rooms, pantries and closets.



A lofty attic is reached by stairs from both ends of the third story. It is divided into three main rooms. The huge iron tank which holds the reserve supply for the elevators is supported on the vestibule walls, about 85 ft. above the tracks. The deck of the central roof is 100 ft. above the tracks. The roof is reached by ladders and trap doors at three points. A flag staff stands at the central point of the roof, from which a regulation ensign, included in the contract, was "flung to the breeze" at daybreak on the 4th.

The baggage buildings require special mention. A description of one applies equally to the other, except as to the third stories. The size is already given. Baggage is received and delivered at the street level; from this story it is lowered or raised by hydraulic elevators, two to each building; the platforms are large enough to hold two of the large "special" trucks loaded to a maximum. The elevators have been tested to 8,300 lbs. each, and further by running all the elevators at as close intervals as could be reached in practice. The "receiving" and "delivery" rooms of each building are supplied with every facility for the rapid handling of baggage and mails. At present two roads receive baggage at the southern building and deliver at the northern one, while the other two roads reverse the operation. (The Chicago, Burlington & Quincy has not yet begun to use the depot). In the lower story of the baggage buildings is ample room for storage; and water-closets, sinks, etc., are provided. The third story of the northern (called western) baggage building is used for offices, and is approached by an outside covered stairway of iron. The third story of the eastern baggage building is divided into "emigrant" rooms, with all conveniences.

The elevator system is worked under a water pressure of some 36 lbs. to the inch, obtained by pumping water into a stand-pipe 10 in. in diameter, built in a flue in the wall and supplying the reserve tank before mentioned. Every possible arrangement is made in the way of reserve pumping power to reduce to the minimum the chances of accident to the apparatus. In a trial 46 trips were run by the elevators without using the pump. The return water flows into two

cisterns sunk 16 ft. below the engine room floor, and is thence pumped back to the stand-pipe and tank. The cisterns are two iron cylinders, connected after sunk, lined with brick in Portland cement.

All but some 400 ft. of the long front of the property on Canal street is laid with a heavy flagstone sidewalk, with vaults underneath and wrought-iron railings at areas in front of buildings and all along the property, which we remember lies from 10 to 15 ft. below the street.

Let us recapitulate: there has been built and finished in one week less than a year the three large buildings, a train-house with platforms and several miles of track, the yard has been graded, three viaducts changed, and withal a careful and methodical system carried out to the minutest detail of the work. The results are remarkable, especially when we know that not a single plan had been prepared two months before receiving bids, and that not one detail drawing had been made at that time. All the plans were prepared in the Chief Engineer's office at Pittsburgh, some 500 plans and details in all. The buildings being all of substantial character, containing some 1,000,000 lbs. of iron, besides another million pounds in the train-house, preclude the idea that they could be *rushed up* easily.

The resident inspector in charge of all the improvements was Mr. Robert Trimble, Assistant Engineer of the Pennsylvania Company, a young man, but a judicious selection; his energy, courtesy and marked capacity for his duties rendered him of the greatest value; to him in a large degree is due the expeditious and faithful execution of the works.

The improvements in Chicago, besides those already mentioned, included third and fourth tracks southward toward the crossing of the South Branch, an engine house, and an extensive yard at the new outer depot.

A large amount of property had to be acquired, difficult, and in many cases delicate, negotiations had to be carried out, between railroad companies, with the city and with private individuals; all these matters and the thousand and one details of the work required the presence of the General Manager and Chief Engineer in Chicago every moment that could be spared from the active work in progress on all the lines of the company. That they have been more than ordinarily successful has been due to a determination to succeed, a judicious selection of contractors, and a systematic and complete oversight of the work; *a foresight* to provide to-day what is needed to-morrow has helped wonderfully to hasten the completion and to prepare everything so that it worked smoothly the very day fixed for the opening. Sunday night trains stopped using the temporary depot south of Van Buren street, and Monday morning the business went on without a hitch from the new one.

The names of the contractors and a list of sub-contractors are given below. In some cases special commendation might fairly be awarded, but it is conceded that the selection was in every way suitable, nor was it made without a careful study of the field before the contracts were awarded.

Sherburn Bryant, of Milwaukee, contractor for all work of the three buildings except iron. Mr. Bryant personally managed the excavation, stone and brick masonry and carpenter work, ably assisted by Mr. Henry, his Superintendent.

Singer & Talcott, sub-contractors for curbstone work of buildings and flag pavements.

Hinsdale Doyle Granite Co., all granite steps (100 in number).

E. Smith, plasterer.

P. M. Almini, painter.

Davidson's Sons, marble.

P. M. Almini, fresco work.

Bassett & Co., plumbers.

Crane Bros. Manufacturing Co., elevators.

Columbus Paving Co., asphalt.

W. H. Wells & Bro., stained glass.

Kinsella & Co., cut glass.

Union Brass Manufacturing Co., brass work.

The contractors for the iron work of the three buildings are:

The Union Foundry Works, all cast-iron work, stairways, front railings and porches.

C. J. Schultz, Iron City Bridge Works, Pittsburgh, wrought-iron and all railings, gates, etc., to train house.

The Delaware Bridge Co. built the train house. A large part of the iron work was manufactured by C. J. Schultz, of Iron City Bridge Works, Pittsburgh.

All the track work was done by the railroad company's men; as many as 350 have been employed on the ballasting and tracklaying at one time; all this was completed before cold weather set in.

James Kincade was the contractor for excavation in the yard and for the third and fourth tracks. Some of the excavated material was removed by wagons; most of it was loaded on cars and hauled away.

Max Maria von Weber.

[Translated for the *Railroad Gazette* from the *Journal* of the German Railroad Union.]

On Easter Monday, April 18, died suddenly of heart disease, Max Maria Baron von Weber, in the 59th year of his age, after he had that morning finished his report to the Minister of Public Works on the railroads and canals of North America. The death of this eminent and extraordinarily gifted man, still in the fullness of his powers, is a heavy loss not only to the art of transportation, which in him loses one of the most eminent railroad experts, but also to the whole civilized world. For, comprehending the great inventions of our age with acute and scientific view, he knew how to set them forth in such a manner that dry technicalities were transfigured with an air of poetry and beauty, and he had the rare power of making perfectly clear to the general comprehension in writing and speech the wonders of engineering, in the most finished manner. Weber was born in Dresden in 1822, the only son of the immortal composer of "Der Freischütz" and "Oberon." He was carefully brought up by his mother, a lady of excellent mind as well as heart. Her direction of his education was supported by the counsel of his father's most faithful friend, the naturalist Lichtenstein. After a thorough classical training he prepared himself for the profession of engineering at the Polytechnic School of his native city, and then began his further practical training for railroad business, first as pupil and then as constructor in the world-renowned great locomotive works of A. Borsig in Berlin. At the same time with this practical work he attended the lecture courses in natural science and political economy of Dove, Magnus, Mitscherlich, etc., at the Berlin University.

Then began his practical railroad career, in which he served from the ranks up (he ran a locomotive himself for a year), through almost all technical and administrative positions of railroad business up to the place of manager.

After passing through the practical service as civil and mechanical engineer on various railroads in East and West Germany, he traveled over Germany, Belgium, France and England, and in the latter remained some time under Isambard Brunel, the constructor of the Thames Tunnel, and Stephenson. Later, at the instance of the French government, he visited Northern Africa and described this journey in a book, "A trip to French North Africa." He was especially interested by the German settlements there, which were greatly fostered by the French government. His observations thereon he gave in a pamphlet, "Algeria and the Emigration Thither."

Returning to Germany he first took charge of the locomotive department, and afterward of the entire operation of the Erz Mountain Railroad, and then in the year 1850 entered the service of the Saxon government, first as manager of the state telegraphs, then, in the year 1852, as technical member of the Royal Directory of the Saxon State Railroads at Dresden, with the title of "Financial Councillor." On the new organization of the Saxon State Railroads in 1868, Weber left the Saxon service and accepted a call to Vienna, where, entering the Austrian Ministry of Trade as Consulting Engineer, with the honorable title and rank of Court Councillor, he hoped to find a wide field for his talent for organization. For he was (called by the Minister Beust) to reorganize Austrian railroading from the foundation, a task which thoroughly suited his wishes, but the fulfilment of which failed, on account of the peculiar circumstances of Austria. Beust's retirement and the crisis of 1873, which succeeded the brief industrial expansion, hindered the realization of Weber's plans. In addition, his sharp North-German manner in official intercourse, which formed a strange contrast to the truly charming amiability which he displayed in private life, did not permit him to obtain a firm footing in his new position. During the Ofenheim litigation, in which he appeared as engineering expert to show the legal sufficiency of the roads built by Ofenheim, he entered into so sharp a conflict with the Banhans ministry that, on the expiration of his five years' contract made with the Austrian government, he gave up his position. Shortly before, as member of a technical court of arbitration, he had traveled over the railroads of European and Asiatic Turkey, while earlier, when there was a discussion as to whether the narrow-gauge system should be introduced into Sweden and Norway, he had traveled over the Northern railroads. After living several years more (until 1877) in Vienna, engaged chiefly on works on science and public questions, he accepted a call from Dr. Achenbach, Minister of Trade, to Berlin, in order to devote his powers to the German Empire and Prussia, while in connection with his position as Consulting Engineer in the Prussian Ministry of Trade he was to undertake the direction of a great ministerial railroad organ. The latter plan was not realized, however, on account of Achenbach's retirement from the ministry immediately thereafter; but Weber was attached in an extraordinary position in the Ministry of Trade, and later in the Ministry of Public Works, and in this position received the appointment to make, on official journeys, thorough studies of canals in Sweden, England, France and North America. He could never really reconcile himself with his new chief's plan of making the railroads into a government system. This was the fatality of the last years of his life: his powerful and original mind, the attractive amiability of his nature, his unusual practical knowledge, made this difficult position easier. He could never make himself quite at home in the Prussian bureaucracy: the whole tendency of his mind was against it; therefore his activity had become more and more literary. In this literay activity likewise lies his most important service. As a technical literary cultivated writer he has won for himself a name throughout the world; in this respect he took uncontested the first place in our literature. His railroad sketches ("Works and Days," "From the World of Labor," Observing and Doing," etc.) and technical newspaper articles are the best that has been done hitherto in this special field.

The literary work that he accomplished, with as great talent as industry, is wonderful. Scarcely a question relating to railroads can be mentioned which the deceased had not treated in an essay or lecture.

Among his professional works the following are prominent: "The Technics of Railroad Operation" (1854); "The School of the Railroad," which, first published in 1861, was translated into almost all European languages; "The Wear of the Physical Organism of Railroad Employés" (1860); "The Dangers to the Employés in the Engine and Train Service of Railroads" (1862); "Railroad Telegraphing and Signaling" (1867); "The Criminal Liability of the Railroads" (1868), etc.

He was especially eager for the introduction of secondary railroads, which he held especially important for promoting the welfare of industry. This question he treated in his writings: "Practice in the Construction and Operation of Secondary Railroads" (1873); "Standard Gauge and Narrow Gauge" (1876); "Government Influence on the Formation of Railroads of Subordinate Rank" (1878). Perhaps Weber's most meritorious contributions to railroad engineering was by his experiments on "The Stability of the Construction of Railroad Track," the results of which he published (1879)* in a work of the same name, and which have caused a reform in the construction of railroad superstructure which is not confined to Europe. Very fruitful was Weber's literary activity in the years 1875-1877, when he undertook to discuss in a popular way the current railroad questions. (We recall only the pamphlets "The Individualization of Railroads;" "Nationality and Railroad Policy;" "Value and Purchase of Railroads," "Private, State and Imperial Railroads;" "What Railroad System best suits Austrian Circumstances," etc). Nearly every volume of our *Journal*, which in Weber loses one of its most faithful and eminent contributors, gives evidence of the literary productions of the deceased. Great, comprehensive works it was still his intention to prepare, and first of all a "History of Transportation," for which he had been making preparations for years, in which he desired to set forth the connection of road construction with the history of civilization from the earliest days down to the present time.

The many-sidedness of his mind is best shown by the excellent life which he wrote of his father, Carl Maria von Weber, which is recognized by connoisseurs as a work of the noblest art intelligence.

Weber was Doctor of Philosophy, honorary and corresponding member of the most prominent engineering societies of Europe and America, Commander and Knight of high orders. He leaves a son, a captain in the Saxon service, and a daughter. His body was taken to Dresden, to be laid in the family vault there by the side of his deceased wife and his immortal father.

The *Austrian Railroad Journal* says of Weber: "Called to the Austrian service by Count Beust, Weber acted as Consulting Engineer of the Ministry of Commerce, but in the condition of things at that time could not accomplish much in that position; his sole great reform was the introduction of a uniform code of signals into Austria-Hungary. * * * Achenbach called Weber to the Prussian Ministry of Trade in 1878; but here also he did not attain an influence corresponding with the original intentions, since shortly after his arrival in Berlin Minister Achenbach was dismissed and replaced by Maybach, which latter introduced into the office an entirely different railroad policy. Moreover, Maybach looked with disfavor upon Weber's literary activity, as contrary to the traditions of the Prussian bureaucracy. * * * Thousands of railroad employés have drawn instruction and inspiration from Weber's works. His important services secure him a permanent place in the history of German railroads."

The Growth of Grain Shipments by the Mississippi River Route.

A committee was appointed by the Joint Executive Committee some time ago to report upon this subject. At the meeting of the Joint Executive Committee, April 27, the following report was submitted by this committee, signed by its chairman, Mr. John King, Jr., First Vice-President of the Baltimore & Ohio Railroad Company and Receiver of the Ohio & Mississippi. The latter road being one of the chief carriers from St. Louis is largely affected by the river shipments, and it is understood that it was in favor last winter of reducing the rail rate to the East in order better to meet the river competition. The report has very great value as giving, for the first time we believe, *definite* statements of what has actually been accomplished by the river barge lines:

The following is a copy of the report of the committee:

REPORT.

CINCINNATI, O., April 27, 1881.

ALBERT FINK, Esq.,
Chairman.

DEAR SIR: The committee appointed to investigate and report on all the facts and details influencing export rates, on account of transportation *via* the Mississippi River, beg leave to submit the following report:

INCREASE OF RIVER SHIPMENT.

The river movement of grain grew from 66,000 bushels of wheat in 1870, to 15,762,664 bushels of corn, wheat and rye in 1880, as per following table.

Year.	Bus. wheat.	Bus. corn.	Bus. rye.	Bus. oats.	Total.
1870	66,000	.....	.....	.....	66,000
1871	.....	309,077	.....	3,000	312,077
1872	.....	1,711,039	.....	.....	1,711,039
1873	.....	1,373,969	.....	.....	1,373,969
1874	365,252	1,047,794	.....	10,000	1,423,046
1875	135,961	172,617	.....	.....	308,578
1876	37,142	1,737,237	.....	.....	1,774,379
1877	351,453	3,578,057	171,843	.....	4,101,353
1878	1,876,639	2,857,056	609,041	108,867	5,451,603
1879	2,390,897	3,585,589	157,424	30,928	6,164,838
1880	5,013,272	9,804,392	45,000	.....	15,762,664

While in 1880 the river carried from St. Louis 15,762,664 bushels of grain, the five railroads running east from St. Louis took only 8,734,591 bushels, of which over 7,000,000 passed through St. Louis in transit from points west and northwest of St. Louis. The amount carried by barges between Jan. 1 and March 23 of this year was 2,298,196 bushels; the rail lines carried, during the same time, 1,088,374 bushels.

BARGE LINES.

We have no means of showing the growth of barge ton-

*This is a mistake. A translation of this work was published in 1870 or 1871 in *Engineering* and the *Railroad Gazette*.—EDITOR.

nage prior to 1881, but it has been very great. Between Feb. 19, the opening of navigation, and April 21, of the present year, a period of two months, the barge lines carried to New Orleans:

	Bushels.
Wheat	1,748,860
Corn	2,803,060
Oats	50,078
Rye	2,423
Total	4,624,421

Besides the above, several cargoes left Cairo and Belmont between Jan. 1 and Feb. 19, of which we have no record, except as to Cairo.

During the ice blockade the past winter between St. Louis and Cairo, the barge lines carried from the latter place 1,100,000 bushels bulk grain.

Now four lines of tow-boats and barges exist, viz.:

	Tow-boats.	Barges.	Bush. capacity.	Bush. capacity to tow to N. O. each month.
Miss. Valley Trans Co.	7	48	2,100,000	1,800,000
St. Louis & New Orleans Trans. Co.	5	35	1,650,000	1,500,000
American Trans. Co.	2	8	400,000	400,000
Mound City Trans. Co.	1	9	540,000	500,000
Missouri Valley Trans. Co.	1	3	175,000	175,000
Total	16	103	4,865,000	4,375,000

The last-named line runs from Kansas City.

There are now building as follows:

Mississippi Transportation Co., six barges, 60,000 bushels capacity each.

St. Louis & New Orleans Transportation Co., one tow-boat and 15 barges, 60,000 bushels capacity each.

American Transportation Co., two barges, 50,000 bushels capacity each.

When these are completed, say before July 1 next, there will be an aggregate tonnage capacity from St. Louis to New Orleans of about 5,000,000 bushels per month. Export oil-cake, tobacco, provisions and flour are also carried by barges to New Orleans.

The barge lines are practically consolidated. They have no regular sailing days, but the average time for a round trip is from from 20 to 25 days, the run from St. Louis to New Orleans being made in from six to eight days. The Mississippi Valley Transportation Co. make a specialty of handling package freight for export.

The capital stock of the barge lines is as follows:

Mississippi Valley Transportation Co	$200,000
St. Louis & New Orleans Transportation Co	800,000
American Transportation Co	40,000
Missouri Valley Transportation Co	100,000

There is now a barge line (Branch's) plying between Evansville and New Orleans. It has one tow-boat and five barges, with a carrying capacity of about 125,000 bushels.

THE EADS JETTIES.

The Eads jetties were opened March 4, 1876. The tables will show the great impetus they gave to the exportation of grain *via* New Orleans. It may be added that of shipments from St. Louis for 1880, 453,447 bushels were shipped by rail to Belmont, and thence by barges to New Orleans. The jetties have brought abundant ocean tonnage, both steam and sail, to New Orleans. Vessels are promptly loaded, eight floating elevators being used for transfer from barges to ships, each with a capacity of from 4,000 to 5,000 bushels grain per hour.

RATES, RIVER FREIGHT, INSURANCE, ETC.

The rates on bulk grain per bushel, St. Louis to New Orleans, in 1880, were:

January and February	9 to 9½ cents.
March	8 " 8½ "
April, May, June and July	7 " 7½ "
August	8 " 8½ "
Sept., Oct., Nov. and Dec.	9 " 9½ "

It is safe to say, that so far in 1881 the rates from St. Louis to New Orleans have varied from 6 to 8½ cents per bushel. River rates from Cairo to New Orleans were from 6 to 8 cents per bushel.

River insurance from both St. Louis and Cairo, from 60 to 75 cents per $100. Rates from Cairo are quoted and bills lading signed to New Orleans only.

COMPARISON OF THROUGH RATES VIA NEW ORLEANS AND NEW YORK.

Of course, through rates *via* New Orleans, as well as *via* Atlantic ports, vary from time to time, but a comparison for one day (28th March last) may be given.

Via New Orleans:	Per 100 lbs
St. Louis to New Orleans, 8½c. per bushel	14.16c.
River insurance to New Orleans, ¾ per cent	.75c.
Ocean rate, New Orleans to Liverpool, 6s. 6d. per quarter of 480 lbs	30.00c.
Ocean insurance, New Orleans to Liverpool, 1 per cent	1.00c.
Transfer at New Orleans from barge to steamer, ⅛ cent per bushel	.83c.
Through	46.74c.
Via New York:	Per 100 lbs.
East St. Louis to New York	40.50c.
Steamer New York to Liverpool, 4¼ cents per bushel	14.87c.
Insurance (ocean)	.90c.
Elevator charges at New York	4.17c.
Through	60.44c.

It is generally believed by experienced parties, that low as river rates now are, they can still be made much lower—in short, that the barges can carry bulk grain profitably at 4 cents per bushel. In this, of course, they will be greatly aided by the up-stream freights they carry, it being the purpose of the promoters of river traffic to build up an import as well as an export trade *via* New Orleans.

NEW RIVER FREIGHT LINE.

A new freight line from St. Louis, by barges, to New Orleans, and thence to European ports, has recently been organized. They quote through rates and issue through bills of lading. A clipping from the St. Louis *Republican*, of March 31, speaking of the first shipment by the new line, is attached:

"DIRECT FOREIGN SHIPMENTS FROM ST. LOUIS.

"Shipments of grain, flour and cotton have heretofore been made from this city on through bills of lading to the United Kingdom and the Continent, but occasionally only, and as negotiated with some railway line to New York or some other Atlantic seaport. But now St. Louis, as has been made known, has a foreign despatch company of her own. The St. Louis & New Orleans, prepared to negotiate through freights and transportation, and having their arrangements completed, negotiated the shipment of flour with the Atlantic mills, and yesterday issued a first bill of lading for 1,500 sacks of flour for Liverpool and Londonderry at a rate of 45 cents gold per 100 lbs., which will lay the flour down in Liverpool at less than 90 cents rate per barrel, whereas it costs 91 cents per barrel to Boston by rail—that being the rate for 125 barrels to the car-load. This is the first contract of the new company, and from it may be dated continued direct exports from this city on bills of lading issued here."

ELEVATORS.

The elevator statistics at East St. Louis and St. Louis are as follows:

Name.	Bush. grain received in 1880.	Bush. capacity.
St. Louis elevator	15,515,072	2,000,000
Central A. "	4,370,836	700,000
" B. "	2,595,190	900,000
E. St. Louis "	6,502,471	1,000,000
Advance "	2,587,602	500,000
Venice "	3,018,670	350,000
St. Louis warehouse	484,287	200,000
Total, 1880	35,064,128	5,650,000
Total, 1879	23,717,612	4,950,000
" 1878	20,048,449	4,025,000
" 1877	14,297,467	3,963,000

The elevators now building at East St. Louis and St. Louis, are:

	Bushels.
Union Elevator, capacity	700,000
Mo. Pac. Elevator (Carondelet) capacity	800,000
Northern " (C., B. & Q.) "	750,000
Advance " additional "	1,000,000
Enterprise " "	100,000

That the interests of certain north and south railroads, as well as railroads west of the Mississippi River are, to some extent, in accord with the New Orleans outlet, will be apparent when it is stated that elevators are being erected at:

	Bushels.
E. St. Louis, by C., B. & Q. R. R., capacity	750,000
Carondelet, by Mo. Pac. R. R., "	800,000
Belmont, by Iron Mt. R. R., "	300,000
Cairo, by Ill. Cen. R. R., "	600,000

COMPARISON OF PORT DUES.

The port dues on the New Orleans side of the river are on Steamers, 15 cents per ton, registered tonnage, for 60 days.

Sailing vessels, 20 cents per ton, on first 1,000 tons, for 60 days, and 15 cents per ton on registered tonnage, over 1,000 tons.

At Algiers, opposite New Orleans, the port dues are about one-third of these figures.

The towage charges on sailing vessels between New Orleans and the Gulf, are now:

Large vessels, registered tonnage, 50 cents per ton.

Small vessels, registered tonnage, 60 cents per ton.

These rates are firm. A year ago, towage charges were 75 cents to $1 per ton, on registered tonnage. Before the jetties were built, towage charges were from $1.25 to $1.50 per ton, registered tonnage. The towage rates now being charged will not increase. On the contrary, they are likely to diminish.

The Baltimore towage rates on sailing vessels vary according to size. For a loaded vessel, 800 tons register, Baltimore to mouth of Chesapeake Bay, 19 cents per ton. A thousand tons register, 16½ cents per ton. Fifteen hundred tons register, 14 cents per ton.

At New York, the charge for towage on sailing vessels from berth to Sandy Hook averages 4 cents per ton on vessels of 1,000 to 1,800 tons, and 6 cents a ton on vessels registered 1,800 to 2,200 tons.

RIVER LINES ABOVE ST. LOUIS.

The Chicago, Milwaukee & St. Paul Railroad have recently established a line of steamers between Dubuque and St. Louis. Already there is talk of the formation of barge lines from up-river points. But with no steamer or barge lines above St. Louis, St. Louis buyers can now (the past winter they have done so), pay as high prices at points in Iowa, on Chicago, Burlington & Quincy as can be paid by Chicago for even May delivery. So that the trade of Chicago is likely to suffer from New Orleans competition.

RAILROAD POOL AT ST. LOUIS.

The heaviest increases in river shipments have been since the formation of the St. Louis pool, the firm rates of the pool making the barge lines formidable as competitors.

WATER COMPETITION AT CHICAGO AND ST. LOUIS.

It should be remembered that whereas at Chicago water competition absolutely ceases during winter, river competition at St. Louis never stops; for, when from ice in winter, or low water in summer, navigation is impeded or suspended between St. Louis and Cairo, the river is always open below Cairo, where, and at Belmont, the barge lines take grain brought there by the rail lines, which, as has already been shown, are erecting elevators to accommodate trade destined to New Orleans.

The chief drawbacks to the New Orleans route are

LABOR.

High prices of labor at New Orleans; combinations among workingmen having made the following prices for labor: in transferring grain, 40 cents per hour in daylight, and 80 cents at night; and for ordinary deck hands, $100 per month and board. At Cincinnati the rate paid deck hands is $1 per day and board.

GRAIN INSPECTION.

No standard for grain at New Orleans. It is sold for export on St. Louis inspection, which increases the risk to sellers, if not to buyers. A standard will doubtless come with the creation of elevator or shore storage capacity.

ELEVATORS AT NEW ORLEANS.

Necessity for stationary elevators and storage room at New Orleans, to unload river craft and load ocean vessels more promptly, to the saving of demurrage and harbor dues.

A site for a large elevator at New Orleans has been bought by St. Louis parties, who are also negotiating for sites on the Algiers side of the river. There will be considerable storage capacity at New Orleans at an early day.

Respectfully submitted, JOHN KING, JR., Chairman.

Convention of the American Society of Mechanical Engineers.

The second regular meeting of this association was held in Hartford, Conn., beginning Wednesday, May 5. The following report is in great part made up from that published in the Hartford *Courant*. The names of the following members, that paper reported, were registered at the United States Hotel in that city on Wednesday:

R. H. Thurston, Hoboken, N. J.; L. B. Moore, Thomas Whiteside Rae, Joshua Rose and Richard W. Ryan, New York City; J. C. Hoadley and C. J. Woodbury, Boston; E. D. Leavitt, Jr., Cambridge; F. A. Pratt, Hartford; D. P. Davis, Jersey City; Geo. H. Smith and E. H. Parks, Providence; Wm. H. Harrison, New Castle, Pa.; J. Sellers Bancroft, Philadelphia; Stephen W. Baldwin, Yonkers, N. Y.; L. K. Fuller, Brattleboro, Vt; Francis H. Richards, Springfield, Mass.; E. G. Parkhurst, Hartford; F. R. Hutton, New York; C. B. Richards, Philadelphia; Alex. Gordon, Hamilton, Ont.; F. W. Gordon, Pittsburgh, Pa.; J. J. White, A. B. Couch and George S. Strong, Philadelphia; C. D. Wainwright and P. McLaren, Boston; William Hewitt, Trenton, N. J.; D. S. Hiaes and Horace B. Miller, New York; John J. Grant, William Mason, S. N. Hartwell, E. J. Murphy and C. E. Billings, Hartford; C. E. Simmonds, East Boston, Mass.; W. F. Durfee, Bridgeport; A. F. Nagle, Providence; Moses G. Wilder, Horace B. Miller, James Brady, Thomas Egleston, Charles E. Emery and W. H. Weightman, New York; Gardner C. Hawkins, Boston; Samuel Webber, Manchester, N. H.; Oberlin Smith, Bridgeton, N.J.; E. B. Gardiner, Passaic, N. J.; Lewis F. Pyne and A. L. Holley, New York; C. H. Brown, Fitchburg, Mass.; George M. Holmes, Gardiner, Me.; J. C. Heming, North Bergen, N. J.; Allan Sterling, Drifton, Pa.; E. N. Trump, Wilmington, Del.; W. H. Odell, Yonkers, N. Y.; Horace Lord, of Colt's Armory; R. W. Ryan, New York; Charles Sperry, Westbrook; H. A. Hill, Boston; George A. Barnard, Hartford; Charles P. Deane, Pottsville, Pa.; E. W. Thomas, Willimantic; Thomas S. Almond, New York; Egbert P. Watson, New York; Jerome Wheelock, Worcester; R. H. Soule, Boston, A. Davis, Montreal; T. L. Churchill, Boston.

OPENING SESSION.

The meeting was held in the Hartford council chamber.

The meeting was called to order at 8:15 p. m. by Professor Robert H. Thurston of Hoboken, N. J., President.

Mr. D. W. C. Pond, President pro tem of the Board of Aldermen (acting Mayor during the illness of Mayor Bulkeley) delivered an address of welcome.

President Thurston, in briefly responding, tendered the thanks of the Society, and said the members had come to Hartford because of its known hospitality, and to see how certain things are done and so well done.

Addressing the members, President Thurston congratulated them upon the rapid growth of the organization. It now has over 250 members, although but a year old, and has a large number of applications for membership.

Mr. L. B. Moore, of New York, Treasurer, made a report showing receipts since organization of $5,217, and a balance on hand of $3,408.53, most of which is invested. A resolution was presented at the previous meeting against making obligatory the adoption of the metric system in our industrial establishments, and it was ordered that the vote thereon be by ballot, to be reported at this meeting. The tellers reported 111 yeas and 24 nays, so the resolution was adopted.

The tellers also reported the ballots on the following named new members, who were declared elected.

For members—Captain John Ericsson, New York; Erastus W. Smith, New York; J. Vaughan Merrick, Philadelphia; Samuel McElroy, Brooklyn; John Alexander, Mechanical Superintendent Standard Oil Co., New York; Stephen E. Babcock, Superintendent and Engineer Troy Steam Heating Company, Troy; George H. Barrus, Boston; John W. Cloud, Altoona, Pa.; Alfred Colin, New York; James E. Denton, Stevens Institute of Technology, Hoboken, N. J.; W. J. M. Dobson, McKesson & Robbins, New York; John Fritz, General Superintendent Bethlehem (Pa.) Iron Works; Robert Forsyth, Superintendent North Chicago Rolling Mill, Chicago; H. P. Gregory, San Francisco; S. N. Hartwell, Hartford; F. G. Tallman and John T. Henthorn, Corliss Steam Engine Company, Providence; Wm. Cleveland Hicks, New York; C. C. Hill, Chicago; Joseph J. Illingworth, Chief Engineer Utica Steam Cotton Mills; Daniel N. Jones, Chief Engineer Cambria Iron Works, Johnstown, Pa.; Henry C. Jones, Hillis & Jones, Wilmington, Del.; William R. Jones, General Superintendent Edgar Thomson Steel Works, Pittsburgh; Louis D. Laureau, New York; William A. Leavitt, Philadelphia; Alexander Miller, Delemater Iron Works, New York; Charles H. Morgan, Superintendent Washburne & Moen Manufacturing Company, Worcester; James Park, Jr., Black Diamond Steel Works, Pittsburgh; Theodore H. Risdon, Mount Holly, N. J.; Oberlin Smith, President Ferracute Machine Company, Bridgeton, N. J.; Horace S. Smith, General Superintendent Joliet (Ill.) Steel Works; Henry F. Snyder, Pardee, Snyder & Co., Watsontown, Pa.; James Thomas, Davies & Thomas, Catasauqua, Pa.; Samuel S. Welman, Manager Ohio Iron & Steel Company, Cleveland; William Oliver Webber, Assistant Engineer Chicago, Burlington & Quincy Railroad, Aurora, Ill.

For Associate—W. H. Bailey, American Tube Works, New York City.

The President announced that Mr. George Bond, of Bridgeton, N. J., had prepared an important paper on Standard Measurement, and as he was not a member, action was necessary. It was voted that he be requested to appear and read the paper.

Mr. W. F. Durfee, of Bridgeport, offered an amendment to the rules, providing that before final printing of any paper which is read, or the debate thereon, the proof sheets shall be sent for correction to the persons interested. The matter was laid over under the rules until the next meeting.

Mr. Church, of the Hartford Engineering Company, said that a letter had been received from Mr. J. M. Allen, President of the Hartford Steam Boiler and Inspection Company, offering the members the use of the company's office and laboratory. President Thurston presented invitations to visit Colt's Armory and Trinity College, and the several invitations were referred to the local committee.

PAPERS READ.

The first paper of the evening was read by the President of the Association, on "The Ratio of Expansion at Maximum Efficiency." In opening, he explained the method of transformation of heat energy into useful mechanical work. The useful work of the machine is that which it transmits beyond its own boundaries to other mechanisms, and this is a maximum at the rate of expansion, which gives energy to the machinery of transmission beyond the engine, at least cost in heat expended. The efficiency of the system is therefore the product of two factors, the efficiency of the fluid and the efficiency of the engine considered as a piece of mechanism. These points were elaborated at length, and with such formulas and technical terms that it would be impracticable to make an intelligible abstract. A conclusion reached was that where the variable loss is due to back pressure and to friction of the engine, the rate of expansion should be such as to cause expansion to the mean pressure line of the engine diagram taken without load; the useful work is the gross work during expansion, and thus adjusted, and the efficiency is nearly proportional to log. *r*. These conclusions may be taken practically without qualification for all actual engines in which the working fluid is gaseous and subject to little direct loss of heat. For steam and other vapor engines still further and greater modifications are necessary. In the steam engine, heat is constantly transferred from the steam to the exhaust, and the efficiency of the engine and the cost of fuel are greatly affected. The heat thus lost frequently amounts to 25 per cent. of the total supplied, and has been known not infrequently to amount to 50 per cent. Since loss from this cause has been found to be so great, and to increase so rapidly with increasing expansion that it practically often sets a limit to the economical increase of the rate of expansion, it is evident that we may determine a point such, that expansion being carried beyond it, the losses due this cause will exceed the gain of work done by the expanding fluid. Measuring the loss at such a point, we may determine the equivalent in foot-pounds of work, and thence deduce the magnitude of a new equivalent "virtual" back-pressure, which, if actually existing as such pressure, would similarly limit expansion. In the remainder of the

paper this and other points were elaborately treated. The address was an interesting one, and is available to the members as it has been printed in pamphlet form. The above gives but the merest abstract.

The next paper was on the same subject, and was read by Mr. Alfred R. Wolff, of New York City. Upon the conclusion of its reading, both papers were discussed by several members. Mr. Charles E. Emery, of New York, did not believe so much in the formulas presented in the papers as in the compilation of results arrived at by experiments—getting practical rather than theoretical results. There was further discussion by Messrs. E. D. Leavitt, of Cambridge; Allan Stirling, of Drifton, Pa.; W. F. Durfee, of Bridgeport; W. H. Harrison, of Newcastle, Pa.; several of the speakers giving the results of their own experience with different kinds of engines.

With the understanding that there would probably be further discussion of these papers, the meeting adjourned at 11 p. m.

SECOND DAY.

The society resumed the debate on the papers read Wednesday evening by President Thurston and Mr. Wolff on "The Ratio of Expansion of Maximum Efficiency." The speakers were Messrs. E. D. Leavitt of Cambridge, W. F. Durfee of Bridgeport, F. R. Hutton of New York, and President Thurston, the latter closing the debate.

The next paper was read by E. D. Leavitt, of Cambridge, Mass., on the "Superior" Engine, now being constructed by the I. P. Morris Company, of Philadelphia, the fourth of its kind built for mining use. Mr. Leavitt gave a detailed description of the working parts of the machine, which is for hoisting purposes, and pointed out the principal features, in diagrams drawn upon the blackboard and large sheets of drawings. The engine has a high pressure cylinder of 40 in., and low pressure of 70 in., both placed vertically and both with six feet stroke of piston. The estimated maximum power is 4,700. The paper was discussed by Charles E. Emery, New York. Alexander L. Holley, New York; G. C. Heuning, Wilmington, Del.; Oberlin Smith, Bridgeton, N. J., and A. Davis, of Montreal.

The next paper was by Mr. Charles E. Emery, on "Alterations to the Cross Head of a Corliss Engine," which he regarded as an improvement. He illustrated by a drawing the change made. Discussed by Messrs. Leavitt and others. Mr. Emery also delivered an address on "Experiments with non-Conductors of Heat." He described the methods of a very ingenious experimental process. Hair felt was the best non-conducting material and is given at 1 (the maximum). No. 2 mineral wool came next, 0.832, and below that a mixture of that wool with tar, 0.715, sawdust 0.680. No. 1 mineral wool 0.676, charcoal 0.632, wood 0.553, loam 0.550, slack lime 0.480, ashes 0.345, coke 0.227, gas house charcoal 0.480, sand 0.214, asbestos 0.363, air space 0.136. Mr. Emery explained that these figures were not the result of single experiment, but were the averages of a large number of experiments. Mr. Durfee, of Bridgeport, said he had seen used to advantage on steam pipes, rings at intervals, then wire cloth, then hair felt, and outside of all, rubber. He had seen an icicle hanging from the outside of a pipe thus protected, in very cold weather. Mr. C. J. H. Woodbury, of Boston, said he had found an effective non-conducting material made of 4 part of coal ashes, 1 of plaster of Paris, 1 of sour flour, and 1 of hair, as for mortar.

A process for copying drawings for shop use, without the use of tracings, was exhibited by S. W. Powel, of Boston. The sensitive paper is prepared in the usual manner by coating ordinary white drawing paper with the following solution: citrate of iron and ammonia, 2½ oz.; red prussiate of potash, 2¾ oz.; water, 16 oz. A thinner and less expensive paper may be used where a large number of copies are required. The drawings are preferably made on Weston's linen record paper, which can be obtained, double elephant size, 120 lbs. to the ream. The copies will be clearer if a little gamboge is added to the usual India ink and red water-color or carmine ink used. The blue print exhibited was made by exposing the prepared paper directly under the drawing in the usual frame of plate glass backed up with felt ½ inch thick. In large frames it will be found best to use screws to press the papers against the glass, as springs of sufficient strength are awkward things to handle. The time of exposure varies from one to one and a half hours.

A. F. Nagle, of Providence, read a paper on "Formula for the Horse Power of Leather Belts." In this he put known facts in convenient mathematical form for engineers. This paper was briefly discussed, and at 12:45 p. m. a recess was taken to 2:30 p. m.

The Society met at 2:30 p. m. The subject of belts was continued in a short paper by Mr. S. S. Webber, of Manchester, N. H., on "Adhesion of Belts," in which he gave the results of several experiments and promised further showing of results.

Mr. H. F. J. Porter, of New York, followed with a paper on the "Binary Absorption System of Ice Machinery." The respective merits and demerits of machines using ammonia, ether, petroleum, sulphurous di-oxide, etc., were exhaustively discussed. The speaker showed very clearly the advantage of using a "binary" liquid, as it might be called, produced by allowing sulphurous di-oxide to absorb ether. With modifications in the machines, this liquid may be used in most of those mentioned. Some of them, with very slight changes, are available.

"Steamboat Cams," an interesting paper by Lewis Johnson, of New Orleans, was read by the Secretary, in the absence of the author. It gave a description of the cams, or valve motion of Western steamboat engines, used commonly on them, but little known here in the East, where the eccentric is universal.

Mr. William Hewitt, of Trenton, read a paper on "The Continuous Rod Mill of the Trenton Iron Company." This mill is on the Belgian system, and owes its novelty alike to the system of handling, and that long rods of one hundred feet can be produced. An extended description was given of the machinery of the establishment. This paper was discussed at some length, mainly upon the high speed of the engine, which is of the Corliss pattern and is run up to 160 revolutions. The debate ran into a general discussion upon high speed, in which several interesting cases were given which had come under the observation of the members. One gentleman thought it possible to safely run up to 600 revolutions with some engines. Mr. J. C. Hoadley, of Boston, related the working of an engine in Lawrence, running 106 revolutions, and doing its work with ease, efficiency and regularity. This is a Buckeye engine of the kind now manufactured by the Hartford Engineering Company.

Mr. Holley, of New York, noted that under the present rules there was a difficulty in the cases of new members. They did not know that their applications were favorably balloted upon until they heard from the meeting, when the ballots were opened by the Council, and therefore did not care to come until they knew the result. Under a suspension of the rules, it was ordered that before each meeting the Council may open the ballots and the applicants may be notified of the result of the ballot.

At 4:40 p. m. the Society adjourned to 7:30 p. m.

THE BANQUET.

Members of the Society and a few invited guests, to the number of about sixty, in all, sat down to an elaborate and well served banquet at Merrill's café Thursday evening, the banquet and the intellectual feast which followed it lasting from 7½ o'clock until midnight. The President of the Society, Prof. R. H. Thurston, of the Stevens Institute of Technology, Hoboken, N. J., presided, the Secretary, Mr. T. W. Rae, of New York City, occupied a position at the other end of the hall. Among the guests present were ex-Governor Alexander H. Holley, of Lakeville, whose son, the distinguished metallurgist, is one of the prominent members of the Society, and the Rev. Mr. Twichell of Hartford. These gentlemen retired early in the evening, Mr. Twichell not being able to remain to respond to the toast intended for him, "The Industry and Virtue of Hartford."

The regular toasts and responses were as follows:

"The city of Hartford—If its wealth is commensurate with its hospitality, the commercial reports of the census stand confirmed."

Responses by Alderman D. C. Pond, President of the Board of Aldermen, in the absence of the Mayor, and by Joseph L. Barbour, who made a very humorous speech.

"The Iron and Steel Institute of Great Britain—The first technical society to break through the Chinese wall of conservatism."

Response by Mr. S. G. Thomas, of England, identified with the progress in steel manufacture under the Bessemer process in England, and now on a visit to this country, and especially to the iron and steel works here.

"The American Society of Civil Engineers—The parent society of engineering in America, fitly spoken for by the eminent child of its most growing offspring."

Response by Mr. C. D. Leaviti, Jr., of Cambridge, Mass.

"The School of Mines—The foundation of engineering as the art of using constructive materials."

Response by Dr. Egleston, of the School of Mines of Columbia College, New York.

"The Pursuit of Science."

Response by Mr. Alexander L. Holley, New York City, in an exceedingly happy speech.

"The best of Lubricants—Printer's Ink."

Response by Mr. Bayles, of *The Iron Age*, in a speech in which fine humor and graceful expression of serious truths and thoughts abounded.

"A formula for post-prandial expansion, condensation and re-evaporation."

Response by Mr. Emery, whose "formula" added another to the graceful responses of the evening.

"The American Institute of Mining Engineers."

Response by Dr. Raymond of the *Engineering and Mining Journal*, who, in closing, paid a feeling tribute to the distinguished inventor and mechanic, Henry R. Worthington, who has died during the year. Mr. Leavitt and Mr. Emery also spoke in warm praise of the deceased.

THIRD DAY.

Thursday, many of the members visited the local manufacturing establishments, including Colt's, Pratt & Whitney's, Billings & Spencer's, the Hartford Machine Company's works and others; and also the State Capitol and Trinity College. Many members also went to Willimantic to visit the thread company's works. The local committee arranged an interesting programme for the day, and as the trip around town was in carriages, the unfavorable weather interfered but slightly.

The closing session of the society was held in the council chamber Friday evening, President Thurston presiding.

A letter was read from Superintendent Rawn, of the New York & New England Railroad Company, Western Division, tendering the civilities of the road and a special car to Boston and return.

Mr. George B. Bond, of the Pratt & Whitney Company, Hartford, read the first paper of the evening on "Standard Measurement," giving a description of the measure of length made at his establishment and describing the processes of manufacture to insure perfect accuracy. Upon the conclusion of the paper President Thurston remarked that the Pratt & Whitney Company were deserving of commendation for bringing accurate, scientifically determined measurements into commercial use. It was, he said, the first instance of the kind of which he had heard. Later in the evening, the discussion being resumed on this topic, Mr. Pratt, of Pratt & Whitney, said in three years past his company had spent between ten and fifteen thousand dollars in arriving at standard measures, and hoped to reach definite results in the next six months.

Mr. J. C. Hoadley, of Boston, read a paper on "Siemens Pyrometer or Calorimeter." This is an instrument for measuring very high degrees of heat, and its operation was exhaustively explained by Mr. Hoadley.

Mr. William H. Harrison, of New Castle, Pa., presented a paper on "The First Rolling Mill in America." This was built by Judge Peter Oliver in 1751 at Middleboro, Mass., and was continued in use until 1830. Judge Oliver had a special permit to establish this mill, the colonists being prohibited generally from coming into competition with the English manufacturers. The business of the mill was to roll down the bars made at the charcoal forges and slit them into rods for nail-making. Eight hundred pounds of iron were run through daily, and the nails were made by hand at houses in that section; they were worth 12½ cents per pound. Mr. Harrison exhibited a drawing of the mill, made from the recollections of a Mr. Wilder, of Newcastle, Pa., who was employed in it in 1818. The paper gave many interesting details as to the process employed.

In the debate which followed the work was contrasted with the improved methods of this time. Some hand-made nails from iron made at the mill were passed around among the members and were viewed with curious interest.

The following resolution was introduced and passed unanimously:

"*Resolved*, That the thanks of this society are due, and are hereby tendered to his Honor, the Mayor, and to the Board of Common Council of Hartford, for the use of meeting and committee rooms; to the manufacturers of the city and vicinity for courtesies extended, and also to the local committee."

Mr. D. N. Melvin, of New York, read the next paper on "A new Form of Pressure Gauge." It was of a very interesting character, and was applauded.

Mr. Oberlin Smith, of Bridgeton, N. J., presented a paper on "Experimental Mechanics." Mr. Smith made the point that there is a great deal of practical information which is not readily available. It is not in print and cannot be had excepting by inquiry from men engaged in each particular line of business, and they are not always easy to reach nor prompt to supply. The result is that very often time is lost in making experiments which have been made a thousand times before, and the results not given to the public. In conclusion, Mr. Smith suggested that work of this general character very properly belonged to this society. One result of this work would be, for one thing, to secure uniformity in the manufacturing of articles of daily use, as to names, sizes, weights, strength, etc., among manufacturers making the same line of goods.

President Thurston favored the systematizing suggested, and believed that in time, by concerted action, the results sought could be reached. He believed that a governmental commission might accomplish important work, if it had proper financial aid from the national treasury. He gave an interesting account of experimental work on iron, etc., conducted in the mechanical laboratory, established in the Stevens Institute in Hoboken.

Mr. Holley, of New York, said that as it seemed from past experience that Congress preferred to have experiments conducted by the Ordnance Department, and as the officers thereof did not appear to care to work in common with civilians, it only remained for mechanical engineers and others to endeavor to stimulate those officers to a class of work and experiments which will be of practical benefit to the manufacturing interests of the country.

S. N. Hartwell, of Hartford, presented a paper on "A Method of Purifying Exhaust Steam from Oil," and a diagram of a machine which will accomplish this important result.

The debate on Mr. Smith's paper was then resumed, several members giving their views briefly. A number of papers remaining to be read were read by title and ordered printed. There was some discussion about the place of the next meeting, which is to be held before next November, on call by the Council, who will also fix the place. Boston, Mass., and Altoona, Pa., have been mentioned.

At 10:45 p. m. the meeting adjourned *sine die*.

Rates on Live Stock.

The following are the proceedings of the committee appointed at the late meeting of the Joint Executive Committee to report on the restoration of rates on live stock:

RATES ON LIVE STOCK.

The committee assembled at 2 o'clock, the Commissioner acting as Chairman.

The Chairman said it was generally understood that live-stock rates were not maintained, and that efforts had been made to secure a restoration of rates, and that in case the rates could not be restored, the lowest existing rate should be adopted as the basis for the general tariff. The difficulty of restoring rates arose from many causes connected with the New England dressed beef and live stock business.

It is claimed that the rates on dressed beef were not maintained, and, therefore, live-stock rates would have to be reduced to meet the dressed-beef rates in order to put both upon the same footing.

The investigation had disclosed the fact that the dressed beef shippers were not charged with the full weight, and that allowances in the way of icing and car hire, etc., were made to the dressed-beef shippers, which reduced the established tariff rate so much that it gave them a great advantage over the live-stock shippers.

In order to overcome these inequalities, the Trunk Line Executive Committee had met on the 10th inst., to carry out resolution No. 4 of the presidents' meeting of the 16th, and it was agreed,

First. To ascertain whether steps could not be taken to have hereafter the correct weight of dressed beef ascertained and charged to the shipper, as is the case with live stock, and all other articles.

Second. That the Commissioner should inquire of each of the trunk lines what allowances of any and every kind are being made to the dressed-beef shipper, in order to ascertain the lowest net rate that the shipper has to pay; and having ascertained these allowances, he should take the lowest rate on the dressed beef and fix the live-stock rate upon that basis, so that the former rate should be 60 per cent. increase of the net live-stock rate.

The Commissioner stated that he had received answers from all the roads. The Baltimore & Ohio, Pennsylvania, and New York, Lake Erie & Western railroads reported that they did not carry any dressed beef to New England. The question was one for the New York Central and Grand Trunk railroads to settle.

He further stated, that he had called this meeting of all parties that were interested in the subject, with a view of determining from the reports made to him what should be the exact rates on live stock upon the above basis after making all the deductions that are being made from the dressed-beef rate.

A general discussion then took place.

The first question considered was the method that should be adopted for ascertaining the exact weight of dressed beef, and having it charged correctly to all shippers.

Mr. Ledyard had previously suggested that the Commissioner should appoint two men to act under him for the purpose of weighing all the dressed beef, such men to be paid by the roads interested in proportion to the business done.

He thought this would be more satisfactory to the other parties, as the men so appointed would be neutral and not under the control of the Michigan Central Railroad.

The Grand Trunk Railway objected to paying a portion of the expenses, as they were properly terminal expenses, which should be defrayed by the terminal roads; they expressed themselves, however, satisfied with any party that Mr. Ledyard should appoint.

It was finally agreed that Mr. Ledyard should, on his own account, appoint men for the purpose of weighing the dressed beef, and pay for their services, this arrangement to continue until such time as any of the parties should become dissatisfied, when proper measures should be taken to remedy the difficulties complained of.

ALLOWANCE FOR SHRINKAGE.

The next subject considered was the allowance for shrinkage.

It was shown that shippers of dressed beef claimed as high as 8 per cent. shrinkage, but that 5 per cent. was allowed. It was also shown that the Chicago roads were allowing as far as Buffalo 4 per cent. shrinkage on live stock, equal to 2 per cent. through to New York.

After an extended discussion as to whether any shrinkage on either class of freight should be allowed, and if so how much, it was

"*Resolved*, That on and after Monday, May 2, 1881, the charges for transportation of dressed beef shall be assessed upon actual weight at the time and place of shipment.

"*Resolved*, That on and after Monday, May 2, 1881, the charges for transportation on live stock shipments from all important points where stock yard facilities exist for weighing live stock, shall be assessed upon actual weight as ascertained, at the time and place of shipment.

"*Resolved*, That the stock yard companies at Chicago, Indianapolis, St. Louis, East St. Louis, Cincinnati and other important stock-shipping points, be required by the terminal roads at these points to construct at an early date weighing scales, at or convenient to the loading pens, for the purpose of weighing all live-stock shipments at the time they are loaded upon the cars for shipment, and when done the transportation charge to be assessed upon the actual weights so ascertained."

ALLOWANCES FOR ICING CARS.

The third question for consideration was the charge for icing. The New York Central & Hudson River Railroad reported to the Commissioner certain amounts paid on dressed-beef shipments; but the representative of the Grand Trunk Railway claimed that his company were not paying anything for icing. As it was shown by other parties that the Grand Trunk Railway

did pay for icing, and Mr. Porteous acknowledged that he was not informed on the subject, it was concluded that further discussion, with the view of arriving at the exact rate paid by the dressed-beef shippers, was unnecessary, until the Grand Trunk Railway could be represented by some one who was in the full possession of all the facts in the case.

It was therefore decided to consider the matter at a subsequent meeting, to be called by the Commissioner, when all parties having full knowledge of the transaction can be present.

The question what should be done in the meantime was then discussed at great length.

Mr. Rutter offered the following resolution, which was passed :

"*Resolved*, That this matter of live-stock and dressed-beef rates be referred to the Trunk Line Executive Committee."

Mr. Smith then offered the following resolution, which was adopted :

"*Resolved*, That pending the action of the Trunk Line Executive Committee, relative to the adjustment of the rates on dressed beef and live stock, the rates on all classes of live stock from all points in the West to New York, Philadelphia, Baltimore and intermediate points, be maintained, regardless of the rates made upon dressed beef and live stock to New England points."

The meeting then adjourned.

In issuing the above report Mr. Fink stated that as there was a prospect of an early settlement of the whole question he had not acted upon Mr. Smith's resolution; but that due notice would be given of the complete restoration of rates, as soon as agreed upon, or of a general reduction, or of the partial restoration as contemplated by Mr. Smith's resolution.

May 2, Mr. Porteous, of the Grand Trunk, telegraphed that he had positively ascertained that no such charge has been paid by this company. Swift, the shipper, furnished ice at his own expense.

On further investigation, the New York Central found that Mr. Porteous' statement was correct, and withdrew its charge.

No settlement having been reached, Mr. Fink last week gave notice of a general reduction of live-stock and dressed-beef rates, liable to advance without notice, to a level with those which the leading New England shippers had been getting.

The Origin of the Illinois Central.

The Chicago *Inter-Ocean* publishes a letter from T. C. Estee, of Chicago, from which the following is an extract :

Probably not more than three persons outside of the "old crew" are now living who were personally familiar with the circumstances which formulated the first movement resulting in a railroad in Illinois. The history reads like a veritable romance, and the truth is stranger than fiction.

Nearly fifty years ago a bill passed providing for state improvements, and authorizing the issuance of bonds guaranteed by the state to pay for them. Over $3,000,000 of these bonds, in denominations of $100 and upward, were issued. Improvements of various kinds were undertaken, but all in the northern part, as the southern part of the state was at the time quite a wilderness, and scarcely organized. After a few years, storekeepers, tradesmen, contractors and farmers had their hats full of these bonds, used to pay debts at an agreed discount.

Large amounts found their way to Chicago, and finally to New York, where in after years a majority of the bonds issued were held by comparatively few capitalists. The question of final payment soon became a serious one.

Because the internal improvements were all made in the north, and because no Legislature for twenty years would make an appropriation for the payment of a dollar of the interest, a great effort was made to repudiate the bonds entirely, and a member was elected from Chicago pledged to do all he could in that direction.

Meanwhile the interest had accrued so that the total indebtedness amounted to over $10,000,000, and it was generally conceded that the next Legislature would and should repudiate the bonds.

At that time there was in the law office of Daniel Webster a young man of most remarkable and peculiar talent and the most incisive shrewdness, who had great reputation in making language appear very attractive, while it most successfully hid the true meaning and possible application. The New Yorkers went to him with the story of the bonds, and employed him to formulate a bill which should aim at the payment of those bonds ; $1,000 was the fee for an acceptable bill which would read like a poem to the West and gather the harvests for the East.

The bill was drawn, submitted and explained, accepted and paid for.

Then comes the offer of $25,000 and expenses if he would secure the passage of the bill by the Illinois Legislature, then about to meet. In the early part of the next session, the young man made his appearance on the floor, as much a stranger as the man in the moon. Liberal, jocose, free and easy, entertaining and manifesting the intensest interest in the development of the great new state, he became an unusual favorite, and before the Legislature adjourned the act became a law. Robert Rantoul, Jr., peace to his early ashes, returned to New York, received his $25,000, and the bonds which were a drug at 5 per cent. suddenly jumped to par at a bound. In the generousness of their great hearts the worthy widow afterward was made the happy recipient of another $25,000.

That act is what is now the charter of the Illinois Central Railroad Company. The old state indebtedness bonds, steadfastly ignored by every Legislature for twenty years, are now almost forgotten, and very few are yet aware that they existed and have been very quietly paid up, interest and principal.

The act gave away absolutely millions of acres of valuable land, while the actual building and operating of a railroad was no more contemplated than the building and supplying a church in every township of the state.

Most of the copies of the act in pamphlet form were boxed and sent to the cellars of the New Yorkers, though printed by the state for distribution; and from one of those boxes comes one to the writer, at the hands of a former employé, in position to know all that was done and most all of what was meant, and from one whose youth was spent in New York, and to whom the officers, faces and names of the actors in this drama were perfectly familiar, these statements are given, with volumes of circumstantial detail.

In the discussions which preceded the passage of the act, nearly a month was spent in providing the best way to protect the interest of the state and its citizens as against a corporation under the charter, and to bring to light at any time any of the transactions of the company holding so valuable a charter. Finally it was agreed upon that the Governor of the state should be a perpetual director, with special and peculiar powers, with voice, vote and authority, as the special guardian of the state. But anticipating that official duties might prevent close personal attention at all times, it gave him power and privilege to appoint a proxy to act for him and perform the duties assigned to him.

The act provided that 7 per cent. of the gross earnings of the organization under this charter should be paid to the state to apply on state indebtedness. That all the lands deeded under the charter should be sold within ten years, to be thereafter taxed by the state.

RAILROAD LAW.

Louisiana State Railroad Bonds.

In the case of Williams, *et al.*, plaintiffs in error, *vs.* the State of Louisiana, the United States Supreme Court has rendered a decision of which the following summary is telegraphed : "The question presented by this case is the legality and validity of certain bonds of the state of Louisiana issued under an act of the State Legislature of April 20, 1871, to the New Orleans, Mobile & Texas Railroad Company. The present plaintiffs in error, who are holders of some of the bonds in controversy, came in in the court below as intervenors in a suit of the state of Louisiana against the State Auditor and State Treasurer to enjoin the payment of the bonds on account of their unconstitutionality. The Court below decided that the bonds were void, whereupon Williams *et al.* appealed. This Court holds that the bonds in question constituted a new debt issued on a new consideration, under a new act of the Legislature, which was itself void because in conflict with the provisions of the state constitution, and that the bonds are equally void as being in excess of the debt which the state could constitutionally create. Judgment affirmed with costs. Opinion by Justice Miller."

A similar decision was also given in the parallel case of Durkee *et al.* against the Louisana Board of Liquidation.

Township Railroads in Ohio.

A dispatch from Columbus, O., May 10, says : "The Supreme Court of this state to-day rendered a decision which declares that the laws passed by the Legislature during its recent session to authorize a certain township to build railroads, and lease and operate the same, are in conflict with section 6 of article 8 of the state constitution, and are therefore void."

THE SCRAP HEAP.

Locomotive Building.

The Rogers Locomotive Works, at Paterson, N. J., last week shipped by steamer from New York the nine locomotives which they have been building for a Spanish railroad. They are the first American locomotives to go to that country.

The Brooks Locomotive Works, at Dunkirk, N. Y., are filling an order for 23 locomotives for the Utah & Northern road. Seven have already been delivered and the rest are to be sent from the works at the rate of two each month.

The Pittsburgh Locomotive Works are running full time, and will not be able to fill all the orders on hand for months to come.

H. K. Porter & Co., in Pittsburgh, are running their works full time, with a number of orders to fill.

The Norwich & Worcester shops in Norwich, Conn., are building a Mogul freight engine for the road.

The Baldwin Locomotive Works, in Philadelphia, turned out 52 locomotives in April. This is, with one exception, the largest month's production ever made at the works.

The Philadelphia & Reading shops in Reading, Pa., have just completed the fourth heavy passenger engine for the Bound Brook line.

The Central Vermont shops at St. Albans, Vt., have nearly completed a Mogul freight engine with 19 by 24 in. cylinders, making the eighth of these engines built in the shops for the road.

The Portland Company, at Portland, Me., has taken a contract to build six locomotives for the Richmond & Danville road.

The *North American* of May 11 says: "The old Camden & Amboy Railroad shops at Bordentown, which have been idle for the last seven years, were leased yesterday to a party from New York for a term of 30 years, for the purpose of manufacturing locomotives."

Car Notes.

The Jackson & Sharp Co., at Wilmington, Del., has recently delivered to the Savannah, Florida & Western road a full equipment of baggage, mail, passenger and parlor cars for its new Florida Short Line, and will shortly complete the order with several dining cars, the first of which is now ready. This car will seat 32 persons at eight tables, and has a kitchen and pantry, thoroughly equipped with cooking apparatus and all necessary linen, china, glass, etc., besides a large refrigerator for storing provisions and a water tank. The car is very handsomely finished and provided with two toilet rooms.

Pennock Brothers are enlarging their car shops at Minerva, O., by a new building 60 by 100 ft. in size.

The Russell Wheel & Foundry Co., at Detroit, has a number of orders for car wheels on hand, and is making also many car castings, besides some very large castings for the Detroit water works.

The Pennsylvania Railroad shops at Altoona, Pa., are now turning out 25 freight cars a day. The passenger shops are building about 12 new passenger cars a month.

The Nelsonville Foundry & Machine Co. has been organized at Nelsonville, O., to build railroad cars and machinery of all kinds.

The Williamsport (Pa.) *Bulletin* says that the new car shops at Watsontown, Pa., are completed and in operation. The firm name of the company is Pardee, Snyder & Co. Ario Pardee, Sr., is Chairman of the association; Oliver Leiser, Secretary; Henry F. Snyder, Treasurer and General Manager; T. W. Frederick, Superintendent of the car department, and Harry D. Heiser, superintendent of the machinery department. The machine shop is 50 by 90, with a wing 85 by 46; engine room, 20 by 22; boiler house, 32 by 72; blacksmith shop, 50 by 60, to which an addition 50 by 50 is being built; wood shop, 150 by 50, and an addition 50 by 50 is being erected; erecting shop, 50 by 80; pattern shop, 31 by 46; paint shop, 16 by 36; iron house, 24 by 14; storehouse, 20 by 40; office, 28 by 32, two stories. The shops are stocked with the latest and best machinery; 175 hands are employed, who are turning out four box cars daily, which production will soon be increased.

The Lobdell Car Wheel Co., at Wilmington, Del., is to be extended. The company has lately bought a tract of 210 acres of land.

Bridge Notes.

It is stated that Clarke, Reeves & Co. have taken the contract for the New York & Long Island Bridge, which is to cross the East River at Blackwell's Island, from Ravenswood, on the Long Island shore, to Seventy-sixth street, New York. The bridge proper will have three spans, one of 618 ft. over the east channel, one of 700 ft. over Blackwell's Island, and one of 734 ft. over the west channel. It will be nearly 200 ft. above the water.

The Wrought-Iron Bridge Co., at Canton, O., has the contract for swing bridges over the Ohio Canal at Newcomerstown and Port Washington.

Sealed proposals will be received at the office of the Clerk of Committees, City Hall, Boston, until noon of May 19, for building an iron bridge over the Boston & Albany road on the extension of Broadway, Boston, Mass. Plans, specifications, etc., may be seen at the office of the City Engineer.

The Atlanta Bridge Works, of Wilkins, Post & Co., have taken a contract to build the bridge over the Chattahoochie River for the new Georgia Western road.

Iron and Manufacturing Notes.

The Bethlehem Iron Co., at Bethlehem, Pa., has declared a semi-annual dividend of 3 per cent. and also a "deferred dividend" of 3 per cent., both payable May 10. This makes 9 per cent. paid on the stock during the past year.

J. H. Sternbergh, at Reading, Pa., is building a rolling mill 190 by 60 ft., adjoining his bolt and nut works. The mill will have a capacity of about 7,500 tons of bar iron yearly.

The Cambria Iron Co., at Johnstown, Pa., is building a number of additional dwelling houses for its workmen.

No. 1 anthracite furnace of the Phoenix Iron Co., at Phoenixville, Pa., during the week ending April 23, made 456 tons pig iron, with an average consumption of 2,464 lbs. coal to the gross ton of iron. The furnace is 15 ft. bosh and 52 ft. high.

Two new blast furnaces are to be built near Goshen, Va., to which steel works are to be added hereafter. A short railroad is to be built from the Chesapeake & Ohio road to the site of the furnaces, which is close to a large deposit of iron ore of very fine quality.

The Akron (O.) Iron Co. has during the past year erected a shop 36 by 75 ft., which is used exclusively for the manufacture of hot polished shafting.

The Rail Market.

For 1882 deliveries steel rails continue at about $60 per ton at mill. There is, however, considerable demand for early deliveries, and quotations are $64 to $65, orders being hard to fill. Sales of English steel rails are reported at from $61 to $62.50 at tide-water.

In iron rails considerable business is reported at from $46.50 per ton at mill for heavy rails, up to $51 for light sections, varying somewhat with location of mill.

Old iron rails are unsettled. Sales are reported at from $26.50 to $28 per ton in Philadelphia.

Railroad spikes are quoted at $2.60 per 100 lbs.; track-bolts, $3 to $3.50 ; fish-plates, $2.40.

An Indian Freight Contract.

The Carson (Nev.) *Appeal* tells this story : "The Indians of the Walker Lake Reservation feel very happy since their victory over Mr. Yerington and the Carson & Colorado Railroad. It appears that when the railroad company treated for the right of way through the reservation, the Indians agreed to receive, in full pay, $700 and the right to ship free over the road forever any fish or other produce which they might wish to bring to market between Hawthorne and the Mound House. Walker Lake is swarming with fine trout, but the Indians did not find the trade very profitable when the item of transportation began to be figured on. The catch was therefore limited by the slim facilities for finding a market before the fish spoiled. When the new road reaches Walker Lake the Indians will be the bosses of the fish trade, and Dayton will be the fish mart of the state. The Indians say that if Mr. Yerington had known how many fish they could catch in a day he would never have entered into such a compact. The Indians laid their wires for this thing long ago. When Mr. Yerington visited Walker Lake they put up a job on him. They invited him to spend a day fishing, which he did, and they gave him a bait which fish absolutely avoid. Several of the bucks also fished with him, some using no bait at all. The result of the day's toil was a small white fish and a couple of half-pound trout. The savages pretended that the day's sport had been very fine, and got up a big dance in honor of a big catch, remarking the fish had never been so good for years. In an unguarded moment he signed his fish contract, and now they say they will be able to keep the Carson & Colorado cars loaded down with nothing but fish all Summer long, but not wishing to be hard on the road, they will allow it to carry pay freight and passengers during the winter months."

A Safety Valve Patent Decision.

The Chicago *Inter-Ocean* of May 6 says: "Judge Blodgett, of the United States Circuit Court, yesterday decided the case of the Consolidated Safety-Valve Co., of Boston, against E. B. Kunkle, of Fort Wayne, Ind. This was a bill filed in October last by the complainants to enjoin the defendant from manufacturing what is known as the Richardson safety valve for steam engines. The Court held that the valve made by Kunkle depended for its operation to some extent, if not wholly, upon the principles used in the Richardson valve. The Court said that in administering the patent law the most dangerous pirating upon well established patents were those that simply approximated to the results by falling a little short in some of the elemental parts and yet come near enough to produce the result the patentee intended. In conclusion the Court held that the Kunkle valve was an infringement of the valve owned by the Consolidated Safety Valve Co., and gave Kunkle the privilege of giving a bond to answer whatever damages might be adjudged on final hearing of the case, or in default of such bond a preliminary injunction should issue restraining the further infringement of the Richardson patent."

Sale of the Centennial Main Building.

The International Exhibition Co. will receive at its office in Philadelphia, until June 1, bids for the whole or any part of the building known to so many as the Main Building at the Centennial Exhibition, and now standing in Fairmount Park. The building is so constructed that it can be taken down and removed in sections, and the material used for erections at other points. Descriptive catalogues, etc., can be procured on application to the President of the company, J. A. Paxson, in Philadelphia.

A Large Casting.

One of the largest cylinder castings ever made was cast on April 28 at the Morgan Iron Works in New York. The casting is 18 ft. long and contains about 90,000 lbs. of iron. It is for a new steamboat now building for the Old Colony Steamship Co., and when finished will be 110 in. in diameter and 14 ft. stroke of piston. The engine is to be a beam engine with single cylinder.

Railroads in Japan.

The Niphon Tetsudo Kaisha (Japanese Railroad Company), has decided to build five railroad lines, which are to be taken up in the following order:

1. From Tokio to Takasaki, with a branch to Awamori.
2. From Takasaki to Tsuruga, in Yechizen. This line will complete a connection between Tokio and Kioto.
3. A line to Nakasendo.
4. A branch from the last line through Niigata to Ushu. These four lines are on the island of Niphon.
5. A line on the island of Kiushiu from Dairi in Buzen, through Kokura to Nagasaki, with a branch to Kumamoto.

Selling a Railroad Short.

Gould to his assistant—Haint the two roads trying to buy the Thayer stock?

Assistant—Yes; N. J. C. and B. & O.

Gould to his assistant—How about Pensy?

Assistant—B'lieve don't want it.

Gould—Yum.

Thayer to Gould—I control the P. W. & B. The fellows that want my stock have got to come up to my figures.

Gould to Thayer—Shoh!

Thayer to Gould—I ain't got myself a majority, but I kin get it.

Gould to Thayer—Right off?

Thayer to Gould—Quicker'n lightning.

Gould to Thayer—If I saw 120,000 shares lying right on that table afore me I'd snatch it at 70.

Thayer to Gould—Would ye though?

Gould to Thayer—I'd plank the cash right down.

Thayer to Gould—Look-a-here! We can hitch on this thing. I'll tell yer what I'll do. I'll make a bargain to deliver you them 120,000 shares at 70.

Gould to Thayer—Shoh! But you daren't put it in black and white!

Thayer to Gould—Just shove me that pen. Here goes.

Bargain consummated.

Kidder, my friend, says Gould, old man Thayer has just sold me short a hundred and twenty thousand P., W. & B. at 70. That's a majority. He ain't got it all himself, but's going to buy it in Boston. Now I'm going to turn it for eight, p'raps sixteen dollars a share. You just rush over to Boston and buy up the whole business yourself without letting the old man know it. Here's the cash. S'long.

Exeunt Kidder to Boston, where he gets the start of the old man and doesn't leave a purchasable share.

Gould to Roberts—Pensy don't want the P., W. & B., does she?

Roberts to Gould—I should smile; but the B. & O.'s got the bulge on us. They're going to get the Thayer stock.

Gould to Roberts—Look at me. D'ye see anything green in m'eye? Now, how much down for 120,000, goods delivered at once?

Roberts to Gould—73—no? How about 75? Well, we don't want it if we've got to pay more'n 78.

Gould to Roberts—Closed.

Mr. Gould retreats from Pennsylvania railroad office and makes this mem:

120,000 sold 78	$9,360,000
120,000 bought 70	8,400,000
The plum	$960,000

A few days after.

Thayer to Gould—Can't do it, old fellow. Tho't I could lay hands on the stock. Be light on me.

Gould to Thayer—Biz is biz, old man. I'm responsible to other parties for them 120,000 shares. Come—pony up.

Thayer to Gould—But how can I? Devil a share outside of my own to be found. Most remarkable affair, and a week ago so plenty, too! Now do let up.

Gould sternly to Thayer—Them shares or forfeit.

Thayer pleading to Gould—But how much?

Gould coldly to Thayer—Difference between 70 and present rate, 79.

Thayer—O Lord. Well, here goes; two nines are eighteen and one to carry—there! a round million gone to the devil!

Gould—I'll be merciful. Plank over $500,000 and sashay. Business transacted and quits.

Lemmesee—said Gould to his assistant—how does the whole thing stand us?

Assistant—She pans out delightfully. Look-a-here. First we scooped the Boston market and discharged into the P. R. R. warehouse. Profit—$960,000. Then we squeezed the old man for $500,000. Aggregate plum $1,460,000.

Gould to assistant—Plums are good, ain't they?

Assistant—Sh'd murmur if they wasn't.

Gould to assistant—Let's go out now and see what we can do with this ere McCalmont stock.

Exeunt, skipping.—*Philadelphia Sunday World.*

A Large Passenger Boat.

There is now under construction at the yard of John Roach, at Chester, Pa., one of the largest passenger boats ever built in this country. It is for the Old Colony Steamboat Co., and will be called the *Puritan*. The vessel will cost about $1,000,000, and will have 300 staterooms and accammodations for carrying 1,000 passengers. She will be 15 feet longer and 4 feet wider than the *Bristol*, of the Fall River line. The *Puritan* is to be 384 ft. long—370 ft. long at water line—87 ft. wide over guards, and 17 ft. 6 in. deep at sides. The double hulls will be divided into 96 water-tight compartments, bearing a pressure of 5 lbs. per square inch. Steam will be supplied from four Redfield boilers, and there will be one immense beam engine, having a cylinder 110 in. in diameter, with 14 ft. stroke. This cylinder was cast last week at Mr. Roach's Morgan Iron Works in New York, and it is said to be the largest cylinder ever cast in this country. The two main shafts for this engine will be 40 ft. long and 27 in. in diameter, forged from wrought iron, and each will weigh 85,000 lbs.

Train and Boat.

By good fortune the steamer *State of New York* escaped a terrible accident early yesterday evening when passing through the draw on the Shore Line Railroad bridge at Lyme. Just as she neared the draw, which was open, a freight train came upon the bridge, running at considerable speed. The train was a heavy one, and could not be checked easily, and did not in fact stop until within 40 or 50 feet of the open draw, through which the steamer, with her 200 sleeping passengers, was at the moment passing. An accident to the brakes or other defect, failing to check the train, might have plunged the engine and forward cars down upon the steamer, and there would have been a dreadful scene. It is reported that the lights on the bridge were properly set, showing to the train that the draw was open.—*Hartford (Conn.) Courant, May 5.*

Runaways.

A singular accident occurred last week, on the Delaware & Hudson gravity road, between Waymart and Carbondale, Pa. The grease that had accumulated on the rails during the winter melted under the warm rays of the sun and made the track so slippery the trains were soon beyond the control of the brakeman, and dashed down the mountain at a rapid and constantly increasing rate of speed. An employé at one of the stations discovered the situation, and quickly placed an obstruction across the track, stopping the runaway cars, but wrecking 56 of them.—*Port Jervis (N. Y.) Gazette, April 29.*

Damages.

An exchange says: "There are a good many peculiar things in this world. If you hire a rig for a trip and the plug of a horse runs off and smashes a shyster buggy—and probably smashes you—you have to settle the affair by paying all the damages. But if you take a trip on a railroad and the train runs off the track and smashes $50,000 worth of rolling stock for the company it don't cost you a cent, and if you get skinned up a little you can collect $10,000 damages. Queer, don't it?"

A sleeper is one who sleeps; a sleeper is also a place where a sleeper can sleep, and a sleeper is, too, a thing over which runs the sleeper in which the sleeper sleeps; so that the sleeper in the sleeper sleeps while the sleeper runs on, as well as sometimes leaps off, the track.—*Pittsburgh Telegraph.*

A Building for the Franklin Institute.

At a recent meeting in Philadelphia the Franklin Institute made arrangements to solicit subscriptions for a building for the use of the Institute. It is proposed to raise a fund of $200,000 in order to put up a suitable building on a convenient site. Subscriptions will be paid to trustees and the Institute does not intend to begin work until a sufficient amount has been paid in or secured.

RAILROAD EARNINGS IN MARCH.

Name of Road.	Mileage.					Earnings.					Earnings per Mile.				
	1881.	1880.	Inc.	Dec	P. c.	1881.	1880.	Increase.	Dec.	P. c.	1881.	1880.	Inc	Dec.	P. c.
Ala. Gt. Southern	290	290	.....	.....	.....	$ 62,005	$ 47,829	$ 14,176	$	29.5	$ 214	$ 165	$ 49	$	29.7
Bos. & N. Y. Air Line	50	50	.....	.....	.....	23,066	23,923	.....	857	3.6	461	478	.....	17	3.6
Bur., Cedar Rap. & No.	564	492	72	.....	1.5	148,551	188,325	.....	39,774	21.2	263	383	.....	120	31.3
Cairo & St. Louis	146	146	.....	.....	.....	41,036	30,079	10,957	.....	36.4	281	206	75	.....	36.4
Central Pacific	2,723	2,350	373	.....	15.3	1,643,000	1,373,438	269,562	.....	19.7	603	585	18	.....	3.1
Chesapeake & Ohio	435	435	.....	.....	.....	228,481	222,762	5,719	.....	2.6	525	512	13	.....	2.6
Chi. & Alton	840	840	.....	.....	.....	511,415	626,473	.....	115,058	18.2	609	746	.....	137	18.3
Chi. & Eastern Ill.	227	159	68	.....	42.5	123,977	88,268	35,699	.....	40.6	546	555	.....	9	1.7
Chi., Mil. & St. Paul.	3,775	2,359	1,416	.....	60.0	917,000	900,674	16,326	.....	1.8	243	382	.....	139	36.4
Chi. & Northwestern	2,770	2,289	481	.....	21.9	1,162,382	1,361,725	.....	199,363	14.6	420	595	..	175	29.4
Chi., St. P., Minn. & O., East Div	310	260	50	.....	10.9	166,999	134,134	32,865	.....	24.5	539	516	23	.....	4.5
St. P. & S. C. Div	620	470	150	.....	30.2	70,066	125,649	.....	55,583	44.1	113	267	.....	154	57.7
Cin., Ind., St. L. & Chi.	300	300	.....	.....	.....	185,004	198,220	.....	13,216	6.5	617	661	.....	44	6.5
Cin. & Springfield	81	81	.....	.....	.....	79,643	75,844	3,799	.....	5.0	983	936	47	.....	5.0
Cleve., Col., Cin. & Ind.	391	391	.....	.....	.....	344,760	344,602	158	.....	.....	882	882	.....	.....	.....
Cleve., Mt. Ver. & Del.	144	157	.....	13	8.3	35,418	36,207	.....	789	2.2	246	231	15	.....	6.5
Denver & Rio Grande	591	337	254	.....	70.5	398,493	168,161	230,332	.....	137.1	674	499	175	.....	35.1
Des Moines & Ft. Dodge	84	84	.....	.....	.....	26,939	25,608	1,331	.....	5.2	321	305	16	.....	5.2
Det., Lansing & No	224	209	15	.....	7.2	107,267	106,431	836	.....	0.8	479	509	.....	30	5.9
East Tenn., Va. & Ga.	270	270	.....	.....	.....	125,592	102,379	22,913	.....	22.2	465	380	85	.....	22.2
Flint & Pere Marq.	300	295	5	.....	1.9	159,587	147,013	12,574	.....	8.5	532	498	34	.....	6.8
Hannibal & St. Jo.	292	292	.....	.....	.....	173,557	216,062	.....	42,505	19.7	595	740	.....	145	19.7
Houston & Tex. Cen.	580	516	64	.....	10.3	325,209	237,745	87,464	.....	36.8	561	461	100	.....	21.7
Ill. Cent., Ill. lines	918	873	45	.....	5.2	437,171	460,074	.....	22,903	4.9	476	527	.....	51	9.7
Iowa lines	402	402	.....	.....	.....	99,224	152,934	.....	53,710	35.1	247	380	.....	133	35.1
Ind., Dec. & Springf.	153	153	.....	.....	.....	31,770	30,412	1,358	.....	4.5	208	199	9	.....	4.5
Int. & Gt. Northern	628	526	100	.....	18.7	225,969	117,592	108,377	.....	91.8	361	223	138	.....	61.9
Kan. City, Ft. S't. & G.	305	176	129	.....	70.4	116,269	89,819	26,450	.....	29.4	381	510	.....	129	25.3
Lake Erie & West	362	362	.....	.....	.....	94,926	74,130	20,796	.....	28.1	262	205	57	.....	28.1
Louisville & Nashv.	1,837	1,287	550	.....	42.6	950,649	604,425	346,224	.....	57.3	517	470	47	.....	10.0
Memphis & Charleston	292	292	.....	.....	.....	115,644	86,975	28,669	.....	32.9	396	298	98	.....	32.9
Memphis, Pad. & No.	115	115	.....	.....	.....	21,216	17,945	3,271	.....	18.2	185	156	29	.....	18.2
Mobile & Ohio.	506	506	.....	.....	.....	226,398	168,301	58,097	.....	34.5	447	333	114	.....	34.5
Nash., Chatta. & St. L.	467	454	13	.....	3.0	207,710	169,457	38,253	.....	22.6	445	373	72	.....	19.3
N. Y. Cent. & H. R.	1,013	1,013	.....	.....	.....	2,668,250	2,854,835	.....	186,585	6.5	2,654	2,818	.....	184	6.5
N. Y. & New England	316	316	.....	.....	.....	212,019	183,845	29,174	.....	15.3	671	581	90	.....	15.3
Northern Central	326	326	.....	.....	.....	452,905	415,323	37,582	.....	9.0	1,389	1,274	115	.....	9.0
Northern Pacific	722	644	78	.....	12.2	143,835	119,358	24,477	.....	20.6	199	185	14	.....	7.6
Paducah & E'town	185	185	.....	.....	.....	44,631	29,578	15,053	.....	50.4	241	160	81	.....	50.4
Pennsylvania	1,902	1,872	30	.....	1.6	3,844,304	3,278,186	566,118	.....	17.2	2,021	1,751	270	.....	15.4
Phil. & Reading	883	926	.....	43	4.7	1,600,568	1,489,389	111,179	.....	7.5	1,813	1,608	205	.....	12.7
Peoria, Dec. & Evans.	192	126	66	.....	52.3	39,643	29,695	9,948	.....	33.2	206	236	.....	30	12.7
St. L., Alt. & T. H., Main Line	195	195	.....	.....	.....	140,179	113,518	26,661	.....	23.4	719	582	137	.....	23.4
Belleville Line	71	71	.....	.....	.....	63,830	55,476	8,354	.....	15.4	899	781	118	.....	15.4
St. L., Iron Mt. & So.	685	685	.....	.....	.....	692,000	451,560	240,440	.....	53.2	1,010	659	351	.....	53.2
St. L. & San Francisco.	627	528	99	.....	18.7	261,959	197,444	64,515	.....	32.7	418	374	44	.....	11.8
St. P., Minn. & Manitoba	866	656	210	.....	32.0	320,962	261,797	59,165	.....	22.7	371	399	.....	28	7.0
Scioto Valley	100	100	.....	.....	.....	28,816	28,005	811	.....	2.9	288	280	8	.....	2.9
South Carolina	242	242	.....	.....	.....	130,841	94,594	36,247	.....	38.3	541	391	151	.....	38.3
Texas & Pacific	654	444	210	.....	47.7	312,420	215,070	97,350	.....	45.3	478	484	.....	6	1.2
Union Pacific	3,330	3,002	328	.....	10.9	1,657,570	1,735,509	.....	77,937	4.5	498	578	.....	80	13.8
Wabash, St. L. & P	2,479	2,300	179	.....	7.8	1,119,591	1,189,268	.....	69,677	5.9	452	517	.....	65	12.6
Total, 52 roads	36,778	31,849	4,985	56	.....	23,220,096	21,415,375	2,693,280	887,959	.....	631	672	.....	41	6.1
Total increase	.....	.....	4,929	.....	15.5	.....	.....	1,805,321	.....	8.4	.....	.....	.....	.....	.....

RAILROAD EARNINGS, THREE MONTHS ENDING MARCH 31.

Name of Road.	Mileage.					Earnings.					Earnings Per Mile.				
	1881.	1880.	Inc.	Dec	P.c.	1881.	1880.	Increase.	Decrease.	P. c.	1881.	1880.	Inc.	Dec.	P. c.
Ala. Gt. Southern	290	290	.....	.....	.....	$ 182,287	$ 154,457	$ 27,830	$	18.0	$ 628	$ 532	$ 95	$	18.0
Boston & N. Y. Air L'e	50	50	.....	.....	.....	63,321	65,174	.....	1,853	2.8	1,266	1,305	.....	39	3.0
Bur., Ced. Rap. & No.	564	492	72	.....	14.6	440,811	337,813	.....	97,002	18.0	781	1,093	.....	312	28.5
Cairo & St. Louis	146	146	.....	.....	.....	105,058	78,409	26,649	.....	34.1	719	537	182	.....	34.1
Central Pacific	2,676	2,350	326	.....	13.3	4,645,907	3,644,539	1,001,308	.....	27.8	1,710	1,551	159	.....	10.3
Chesapeake & Ohio	435	435	.....	.....	.....	575,410	623,778	.....	48,368	7.7	1,323	1,434	.....	111	7.7
Chicago & Alton	840	840	.....	.....	.....	1,472,176	1,647,541	.....	175,365	10.6	1,753	1,961	.....	208	10.6
Chi. & Eastern Illinois	227	159	68	.....	42.8	365,828	244,009	121,819	.....	49.9	1,611	1,535	76	.....	5.0
Chi. & Gd. Trunk	335	335	.....	.....	.....	331,747	279,718	52,029	.....	18.3	990	835	155	.....	18.3
Chi., Mil. & St. Paul.	3,775	2,359	1,416	.....	60.0	2,591,000	2,403,721	187,279	.....	7.8	687	1,019	.....	332	32.6
Chi. & Northwestern	2,770	2,289	481	.....	21.0	3,366,214	3,648,040	.....	281,806	7.7	1,215	1,594	.....	379	23.8
Chi., St. Paul, Minn. & O., Eastern Div	310	260	50	.....	23.1	412,087	331,583	80,504	.....	24.3	1,329	1,275	54	.....	4.3
St. P. & S. C. Div	620	453	167	.....	36.9	239,402	295,105	.....	55,703	18.7	386	654	.....	268	41.0
Cin., Ind., St. L. & Chi.	300	300	.....	.....	.....	517,451	526,458	.....	9,007	1.7	1,725	1,755	.....	30	1.7
Cin. & Springfield	81	81	.....	.....	.....	224,750	208,500	16,250	.....	7.8	2,775	2,574	201	.....	7.8
Cleve., Col., Cin. & Ind.	391	391	.....	.....	.....	915,839	949,166	.....	33,327	3.5	2,342	2,427	.....	85	3.5
Cleve., Mt. V. & Del.	144	157	.....	13	8.3	97,638	105,011	.....	7,373	7.0	678	668	10	.....	1.5
Denver & R. G	564	337	227	.....	67.4	1,023,650	421,345	602,305	.....	143.4	1,815	1,250	565	.....	45.2
Des Moines & Ft. D'ge	84	84	.....	.....	.....	68,379	65,052	3,327	.....	5.1	814	775	39	.....	5.1
Det., Lansing & No.	224	209	15	.....	7.1	265,226	266,547	.....	1,321	0.5	1,184	1,275	.....	91	7.1
East. Tenn., Va. & Ga	270	270	.....	.....	.....	344,861	318,440	26,421	.....	8.3	1,277	1,179	98	.....	8.3
Flint & Pere Mar.	300	295	5	.....	1.7	414,851	375,029	39,822	.....	10.6	1,383	1,271	112	.....	8.8
Grand Trunk	1,404	1,273	131	.....	10.3	2,601,162	2,490,432	110,730	.....	4.4	1,853	1,956	.....	103	5.3
Great Western	526	526	.....	.....	.....	1,275,384	1,190,294	85,090	.....	7.2	2,425	2,263	162	.....	7.2
Hannibal & St. Jo.	292	292	.....	.....	.....	452,737	559,106	.....	106,369	19.0	1,550	1,914	.....	364	19.0
Houston & Texas Cen	580	516	64	.....	12.4	1,010,552	829,578	180,974	.....	21.8	1,742	1,608	134	.....	8.3
Ill. Cen., Ill. lines	918	873	45	.....	5.2	1,336,205	1,414,792	.....	78,587	5.3	1,456	1,621	.....	165	10.2
Iowa lines	402	402	.....	.....	.....	293,513	406,655	.....	113,142	27.8	730	1,012	.....	282	27.8
Ind., Dec. & Springf.	153	130	23	.....	17.7	105,651	65,043	40,608	.....	62.4	691	500	191	.....	38.2
Inter. & Gt. Northern	608	526	82	.....	15.6	618,055	417,349	200,706	.....	48.1	1,017	793	224	.....	28.3
Kans. City, Ft. S. & G'lf	305	176	129	.....	73.3	326,994	279,692	47,302	.....	16.9	1,072	1,589	.....	517	32.6
Lake Erie & Western.	362	326	36	.....	11.0	288,589	198,154	90,435	.....	45.7	797	608	189	.....	31.1
Louisville & Nash.	1,837	1,167	670	.....	57.4	2,562,149	1,853,915	708,234	.....	38.2	1,394	1,588	.....	194	12.2
Mem. & Charleston	292	292	.....	.....	.....	337,536	318,492	19,044	.....	6.0	1,156	1,091	65	.....	6.0
Mem., Pad. & No.	115	115	.....	.....	.....	57,649	54,038	3,611	.....	6.6	501	470	31	.....	6.6
Minn. & St. Louis	218	170	48	.....	28.2	160,999	139,694	21,305	.....	15.3	739	821	.....	82	10 0
Mobile & Ohio	506	506	.....	.....	.....	685,994	622,511	63,483	.....	10.2	1,356	1,230	126	.....	10.2
Nash., Chatta. & St. L.	467	454	13	.....	2.8	576,719	566,246	10,473	.....	1.9	1,235	1,248	.....	13	1.9
N. Y. Cent. & H. R.	1,013	1,013	.....	.....	.....	7,366,426	7,765,678	.....	399,252	5.1	7,272	7,666	.....	394	5.1
N. Y. & New England	316	316	.....	.....	.....	578,195	497,984	80,211	.....	16.1	1,830	1,576	254	.....	16.1
Northern Central	326	326	.....	.....	.....	1,221,719	1,080,079	141,040	.....	13.1	3,747	3,315	432	.....	13.1
Northern Pacific	722	644	78	.....	12.1	337,661	278,007	59,654	.....	21.5	468	432	36	.....	8 3
Pad. & E'town	185	185	.....	.....	.....	127,625	93,330	34,295	.....	33.5	689	504	185	.....	36.6
Pennsylvania	1,902	1,872	30	.....	1.6	10,129,134	9,306,314	822,820	.....	8.8	5,325	4,971	354	.....	7.1
Peo., Dec. & Evansv.	192	126	66	.....	52.4	118,785	69,123	49,662	.....	72.0	619	548	71	.....	13.0
St. L., A. & T. H., M. Li'e	195	195	.....	.....	.....	351,711	319,428	32,283	.....	10.1	1,803	1,638	165	.....	10.1
Belleville Line	71	71	.....	.....	.....	192,174	166,442	25,732	.....	15.5	2,707	2,344	363	.....	15.5
St. L., Iron Mt. & So.	685	685	.....	.....	.....	1,823,749	1,497,739	326,010	.....	21.7	2,662	2,186	476	.....	21.7
St. Louis & San Fran.	627	509	118	.....	23.2	652,628	592,783	59,845	.....	10 1	1,041	1,165	.....	124	10.7
St. P., Minn. & Man	866	656	210	.....	32.0	734,631	579,681	154,950	.....	26.7	848	884	.....	36	4.1
Scioto Valley	100	100	.....	.....	.....	73,445	70,287	3,158	.....	4.5	734	703	31	.....	4.4
South Carolina	242	242	.....	.....	.....	366,796	332,818	33,978	.....	10.2	1,516	1,375	141	.....	10.3
Texas & Pacific	621	444	177	.....	39.9	836,394	680,020	156,374	.....	23.0	1,347	1,531	.....	184	12.0
Wab., St. L. & Pacific.	2,479	2,300	179	.....	7.7	2,750,130	3,051,014	.....	300,884	9.7	1,109	1,326	.....	217	16.7
Total, 54 roads	34,923	30,010	4,926	13	.....	59,025,004	54,986,753	5,747,610	1,709,359	.....	1,690	1,832	.....	142	7.7
Total increase	.....	.....	4,913	.....	12.4	.....	.....	4,038,251	.....	7.3	.....	.....	.....	.....	.....

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EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement: Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published*

MARCH EARNINGS.

Our table of March earnings has returns from 52 railroads with an aggregate length this year of 36,778 miles of road, which is 4,929 miles, or 15½ per cent., more than they worked in March of last year, and is nearly 40 per cent. of all the roads in operation in the United States. With this larger mileage they earned $23,220,696, which is 8.4 per cent. more than they earned on the smaller mileage last year: and their average earnings per mile of road fell from $672 to $631, or 6.1 per cent. Considering the fact that so very large a part of the additional mileage is new road in very thinly peopled country, and that many roads that report had their traffic much interrupted by snow in March, and further that traffic in March last year was extraordinarily large (53 roads reporting then showed an increase of 30 per cent. in total earnings and of 20 per cent. in average earnings per mile), the result is better than might have been expected. Of the 52 roads, 39 have an increase in total earnings, and 32 in earnings per mile. The largest percentages of increase in earnings per mile were 35 per cent. on the Denver & Rio Grande, 62 on the International & Great Northern, 33 on the Memphis & Charleston, 34½ on the Mobile & Ohio, 50½ on the Paducah & Elizabethtown, 53 on the Iron Mountain, and 38 on the South Carolina—some of them very large, it will be seen. The largest decreases were 31 per cent. on the Burlington, Cedar Rapids & Northern, 36½ on the Chicago, Milwaukee & St. Paul, 57½ on the St. Paul & Sioux City, and 35 on the Iowa lines of the Illinois Central, every one of which (with several others) were greatly troubled by snow in March. If we take these roads by themselves, together with the Chicago & Northwestern, we will find that with an increase of more than one third in mileage their earnings fell off 12.2 per cent., and their average earnings per mile decreased from $454 to $290, or 36 per cent. The other 47 roads, whose mileage increased from 25,837 to 28,647, increased their average earnings per mile of road from $723 to $727—so the snow alone sufficiently accounts for the decrease in the total. There are, however, some decreases not to be accounted for in this way, but as traffic was extraordinary in March of last year, there is no need of accounting for them.

Six roads report whose traffic is largely through freight carried at trunk-line rates. All of these but the New York Central have larger earnings this year, and in the aggregate their earnings have increased 6.3 per cent. There is very little change in their mileage. Rates on this through traffic (in both directions) were the same this year as last.

Four roads largely or chiefly engaged in carrying to St. Louis report. These show an increase of 44 per cent. in total earnings and of 34½ per cent. in earnings per mile. All show an increase. Their aggregate length is but 1,529 miles.

Six roads report which are largely or chiefly engaged in carrying produce to Chicago, and of these three show an increase and three a decrease in earnings, and *all* a decrease in earnings per mile. Together these roads had 6,920 miles of road last year and 8,932 this year, but in spite of this vast increase of mileage their aggregate earnings *decreased* $108,893, and their average earnings per mile fell from $519 to $390—just about one-fourth. The Chicago roads include most of those whose traffic was longest interrupted by snows. This contrast between the St. Louis and the Chicago roads is very striking.

No less than 14 Southern roads are included in the table. All of these but one have increased earnings, and in several cases the increase is large. The Wabash and the Union Pacific, whose vast increases of mileage a little more than a year ago have made comparisons of their earnings with those of the previous year comparatively valueless, had nearly as much road in March of last year as this year. Both, with some increase in mileage, show small decreases in total earnings and considerable ones (13.8 and 12.6 per cent.) in earnings per mile of road.

Below we give our usual table of earnings per mile of road in March for six successive years:

March Earnings per Mile of Road for Six Years.

	1876.	1877.	1878.	1879.	1880.	1881.
Burl., C. R. & N.	$229	$199	$303	$258	$383	$263
Cairo & St. L.	135	142	131	127	206	281
Cen. Pac.	842	698	580	574	586	603
Chic. & Alton	547	510	527	483	746	609
Chic. & E. Ill.	...	356	377	422	555	546
Chic., M. & St. P.	405	332	469	357	382	243
Chic. & N. W.	520	440	527	514	595	420
Ch., St. P., M. & O. East. Div.	....	....	...	502	516	539
St. P. & S. C.	....	....	....	287	267	113
Cin., Ind., St. L. & C.	713	551	576	507	661	617
C., C., Cin. & Ind	766	658	676	598	882	882
C., Mt. V. & Del	188	187	194	178	231	248
Denver & R. G.	261	183	309	....	499	674
E. Tenn., Va. & Ga.	....	299	....	330	380	465
Flint & P. M.	....	....	....	352	498	532
Hannibal & St Jo.	469	553	549	726	740	595
Hous. & Tex. Cen	....	318	334	408	461	569
Ill. Cen. in Ill.	590	514	492	469	527	476
Ill. Cen. in Iowa	405	284	332	328	380	247
Int. & Gt. North	231	217	194	237	223	361
Louisv. & Nash.	406	434	450	434	470	517
Mem. & Charles.	...	...	227	325	298	396
Mem., Pad. & Nor.	....	125	161	109	156	185
Mobile & Ohio	284	263	315	322	333	447
Nash., Chat. & St. L.	428	400	411	428	373	445
N. Y. Cen. & H. R.	....	....	....	2,431	2 818	2,634
Northern Cent.	996	904	841	1,025	1,274	1,389
Pad. & Eliz.	....	....	....	120	160	241
Pennsylvania	1,633	1,427	1,399	1,457	1,751	2,021
Peoria, D. & Ev.	....	....	....	132	236	206
Phil. & Reading	871	1,078	824	1,107	1,608	1,813
St. L., A. & T. H., Belleville Line	595	612	550	632	781	899
St. L., Iron Mt. & S.	433	512	502	516	659	1,010
St. L. & San Fran.	312	339	305	284	374	418
Scioto Valley	....	....	185	246	280	288
S. Carolina	350	375	398	352	391	541
Tex. & Pac	382	400	363	239	484	478

Of the 37 roads in this table whose earnings per mile are given for from three to six years, no less than 23 had larger March earnings this year than in any other reported, and 23 out of 37 also had larger earnings this year than last, while 31 out of 36 had larger earnings last March than in 1879. Of 30 reporting for 1878, only five had larger earnings then than this year; of 29 reporting for 1877 only five, and of 25 reporting for 1876 only six.

The progress made in some cases is very great. Thus the Chicago & Eastern Illinois earned this year about one-half more than in 1877, the Cleveland, Columbus, Cincinnati & Indianapolis 47½ per cent. more than in 1879; the Denver & Rio Grande 268 per cent. more than in 1877; the East Tennessee, Virginia & Georgia 55½ per cent. more than in 1877; the Flint & Pere Marquette one-half more than in 1879; the Houston & Texas Central (which is one of the few that has gained every year without interruption) 76 per cent. more than in 1877; the International & Great Northern (whose earnings till this year have been nearly stationary), 86 per cent. more than in 1878; the Northern Central 65 per cent. more than in 1878; the Reading 120 per cent. more than in 1878; the Belleville Line 63 per cent. more than in 1878; the Iron Mountain 133 per cent. more than in 1876 and 100 per cent. more than in 1878; the St. Louis & San Francisco 47 per cent. more than in 1879; the Scioto Valley 50 per cent. more than in 1878; the South Carolina 54 per cent. more than in 1879; and the Texas & Pacific 41 per cent. more than in 1879. Such comparisons with the earnings of very recent years show what tremendous progress has been made in the business of many parts of the country.

For the three months ending with March, our table has reports from 54 railroads, with 34,913 miles of road this year, which is 4,913 miles, or 13.4 per cent., more than they worked last year. With this increase of mileage, their earnings increased $4,038,251, or 7.3 per cent., to $59,025,004, their average earnings per mile of road having decreased from $1,832 to $1,690, or 7.7 per cent. Considering the great increase in expenses, due to the severity of the weather, it is probable that the net earnings were smaller this year than last, in spite of the great addition to the mileage. But it should be remembered that both gross and net earnings were extraordinarily large in the winter of 1879–80, traffic being large and the weather being unusually favorable to economical working.

Of the 54 railroads reporting for the three months, 39 have an increase in total earnings and 30 an increase in earnings per mile. The largest percentages of increase and decrease in earnings per mile were:

Increase.	P. c.	*Decrease.*	P. c.
Cairo & St. Louis	34.1	Bur., Cedar Rapids & N.	28.5
Denver & Rio Grande	45.2	Chic., Mil. & St. P	32.6
Ind., Dec. & Spring	38 2	Chic. & N. W.	23.8
Int. & Gt. North	28.3	St. Paul & Sioux City	41.0
Lake Erie & West	31.1	Ill. Cen in Iowa	27.8
Pad. & Eliz.	36.6	K. C., Ft. Scott & G.	32.6

The roads with the largest and smallest earnings per mile this year are:

Largest.	Per mile.	*Smallest.*	Per mile.
N. Y. Cen.	$7,272	St. Paul & Sioux City	$385
Penna.	5,325	North Pac.	468
North. Cen.	3,747	Mem., Pad. & Nor.	501
Cin. & Spring	2,775	Peoria, Dec. & Ev.	619
Belleville Line	2,707	Ala. Gt. South	628
Iron Mt.	2,662	Clevd., Mt. V. & Del.	678
Great Western	2,425	Chic., Mil & St. P.	687
C., C., C. & Ind.	2,342	Paducah & Eliz.	689
Grand Trunk	1,853	Ind., Dec. & Spring	691
N. Y. & New Eng.	1,830		

The St. Paul & Sioux City was so buried in snow that most of it was not worked for two of the three months, and the earnings of the Chicago, Milwaukee & St. Paul, and probably of the Northern Pacific, were also greatly reduced by the same cause.

THE BREAKAGE OF CAR WHEELS.

If current report speaks truly, there never were so many car wheels broken, in the same length of time, as during the past severe winter. The cause to which this has been attributed is the exceptionally cold weather. Doubtless this was one cause, but to what extent it was the *sole* one it would be both interesting and profitable to inquire. It has been shown conclusively that more rails break in winter than in summer, and, what is curious, more boilers blow up in the cold than in the warm months, but to conclude therefrom that the increase in the number of explosions or of the fracture of rails is due to the cold weather is not an adequate explanation. It would be a more correct statement to say that more *weak* boilers fail and *bad* rails break in winter than in summer. In the same way it should be said that more *poor* wheels fail in cold than in warm weather. In other words, it requires a combination (to use patent phraseology) of poorness or badness *and cold* to cause a great increase in the rate of breakage. If this were not true, that is, if the cold alone were the cause of the increase of breakages, then *all* wheels would break whenever cold weather set in. The proposition might be stated conversely, and it might be said that all wheels which fail in cold weather are bad, and the question would then come up, what is the quality in them which constitutes the badness, which, in conjunction with cold, causes them to break.

Unfortunately, we do not know to what extent railroad managers or those in charge of the cars or other rolling stock have addressed themselves to this inquiry. That it would be very profitable to them and interesting to all if they did so, and let the results of such investigations be known, is certain. Owing to the fact that every railroad company, or rather its officers, seem to use their utmost efforts to keep the reports of the number, character and circumstances of the wheel breakages secret, it is impossible to draw any deductions from the facts, which might have the utmost value if such reports were accessible. The character and locality of the fracture of different kinds of wheels, if noted, would be almost certain to indicate defects in their form and proportions. Our knowledge of the effect of the shape of cast-iron wheels on their strength is almost entirely of an empirical character, and there has never been, so far as we know, any investigation of the subject which could be said to be a thorough or scientific study of it. A general impression exists that the plate which connects the hub with the tread of a wheel should not be made flat, but that it should have corrugations concentric with the periphery,

which will permit the plate to spring somewhat as it contracts in cooling. The shape of these corrugations seems thus far to have been determined entirely by the rule of thumb. On the other hand it may be said that some of the oldest and most successful wheel-makers have been for years, and still are, making thousands of what are called single-plate wheels, in which the plate is entirely flat and without any provision whatever for the contraction of the wheel in cooling. These wheels are, however, carefully annealed and allowed to cool very slowly, so as not to contract in one part before they do in another. If the proportionate number of breakages and the character and locality of their fracture were reported, it would probably be a very valuable contribution to our knowledge of the weak points in the different patterns of wheels. Nearly all of these were designed and put into use before the increase in the weight and carrying capacity of cars, which has become the practice during the last five or ten years. They were designed to carry loads not exceeding 5,000 lbs. per wheel, and without any change in their proportions they are now expected to carry 8,000 lbs. One of two things is certain: either the wheels were heavier and stronger than necessary then, or they are too light and too weak now. It has also happened in many cases that the size of axles has been increased in the wheel-seat from about 4 in. to 4⅞ in., without any corresponding enlargement of the hub of the wheel. It should not be surprising then that there has been this winter an unusual number of wheels that have become loose on the axles. What the circumstances seem to demand is a thorough revision of the wheel patterns and an increase in their weight and strength somewhat in proportion to that of the loads which they must now carry. It seems as though it might be best, too, to increase the size of wheels from 33 to 36 in. in diameter. The shock in going over a rough track is certainly less to a wheel of large diameter than it is to a small one, and a larger mass of metal has greater power to resist concussion than a small one. Thus a cast-iron ball 1 in. in diameter would be crushed under a blow from a steam hammer, whereas a 15-in. cannon ball would receive only a slight indentation from the same blow.

There can be no doubt, too, that wheels are often subjected to great strains by not being the right distance apart or correctly gauged. The groove in a frog through which the flange of a wheel must run is only from 2 to 2¼ in. wide, and the width of the flange of the wheel which must pass through this groove is from 1½ to 1¾ in., so that we can see how easy it would be, if the gauge of the wheels or of the track was not correct, to strain either or both of them to a dangerous degree. Every car inspector knows that not only do very great inaccuracies of this kind often exist, but also, owing to the relative position of the axles, that trucks are often "out of square," as it is called. Such defects, with mismatched wheels—that is, wheels of different diameters on the same axle—with a track in bad condition, will account, no doubt, for many breakages of wheels which would not otherwise occur, even though the weather were cold.

The great demand during the last two years for all kinds of railroad material has undoubtedly led to the manufacture and use of great quantities of cast-iron wheels of inferior quality. Railroad companies, like other consumers of manufactured articles, are inclined to be exacting somewhat in inverse proportion to the demand, and the difficulty of having their wants supplied. When it is hard to have orders filled, the material received is apt to be less rigidly inspected than when all the producers are anxious to get orders.

The fact, too, that the authority to buy and the experience of the user of materials are so widely divorced on many roads brings into action two antagonistic principles. The mere buyer of wheels is apt to look only at the cost per wheel, and therefore is inclined to get them at the lowest price. The user of them would estimate their value, not at so much per wheel, but at so much per thousand miles of service. It is only when a winter like the past one is unusually destructive to bad wheels that the buyer can be made to realize that the lowest-priced wheels are not the cheapest.

What seems to be needed in car-wheels, as it is in the purchase of most other material for railroads, is some simple specifications which would designate those qualities which a good wheel must have, and which would indicate some practicable method of testing their quality. It may be, of course, that no such test is attainable, and that all that can be done is to buy wheels with a guarantee from the manufacturer for a given amount of service, thus making it his interest to furnish good material. The fact that a good quality of cast iron will stand the shocks which a car-wheel must or should resist, however, needs no proof. If, therefore, some thorough tests were made of the material of those wheels which break most, and a comparison made of its physical qualities with those of the metal of which the wheels are made that have the smallest proportion of breakages, it would be quite certain to shed some light on this important question. At any rate, railroad companies have much more to gain than to lose by making the facts known, especially if, as report says was the case last winter, they are all about equally unfortunate, in this respect.

THE MISSISSIPPI BARGE LINES.

At the last meeting of the Joint Executive Committee in New York, Mr. John King, Jr., who is the chief executive of the Baltimore & Ohio's lines west of the Ohio, made a long report on the growth of the grain movement from St. Louis down the Mississippi, the barge lines, their cost, charges, etc., and their effect in competing with the railroads which carry to Eastern ports. This is an extremely useful and interesting document: because, although a great deal has been said in a general way as to this comparatively new traffic, there has been a dearth of those definite statements which alone enable us to judge.

The traffic has already assumed large proportions. Mr. King shows that while 15,762,664 bushels of grain were shipped from St. Louis down the river in 1880, only 8,734,591 bushels were shipped thence by rail that year. Mr. King's further statement that of the through rail shipments "over 7,000,000 bushels passed through St. Louis in transit from points west and northwest of St. Louis," if true in the sense that naturally would be ascribed to it, that is as grain not stopping at St. Louis at all, but simply passing through it without being unloaded, would show that rail grain shipments from St. Louis had already virtually ceased last year, as it would leave but 1,735,000 bushels as shipments made by rail from St. Louis itself. The records of the St. Louis shipments, however, show that this cannot be true, but that by far the greater part of the grain carried east from St. Louis by the railroads is received at the city and not in cars from connecting roads. But the fact that the shipments down the river were nearly twice as great as the total rail shipments last year is sufficiently significant to justify careful investigation. We do not know how this statement of rail and river shipments in 1880, amounting to about 24,500,000 bushels, can include the total St. Louis shipments of that year. Its receipts of grain, meanwhile, were 47,700,000 bushels, and though St. Louis consumes a great deal of wheat and barley in its great mills and breweries, it can hardly consume as much as 23,000,000 bushels a year.

It will be interesting to compare Mr. King's statement of the St. Louis river shipments with the reports of New Orleans receipts. Mr. King gives the St. Louis river shipments as only 66,000 bushels in 1870, while the Produce Exchange reports the New Orleans receipts at 6,871,253 bushels that year. New Orleans does not receive by St. Louis alone, it is true; but its receipts for export from other places are comparatively small, and it receives very little by rail. In later years the St. Louis shipments agree more nearly with the New Orleans receipts, as shown below:

Year.	St. Louis shipments.	New Orleans receipts.
1876	1,774,379	5,822,475
1877	4,101,353	8,225,951
1878	5,451,603	7,597,648
1879	6,164,838	11,944,406
1880	15,762,664	19,051,677

In earlier years the receipts of New Orleans have been chiefly corn and oats for domestic consumption. These come largely from various Ohio and Mississippi River landings, brought by ordinary steamboats, the valley from Pittsburgh to Memphis being a great corn-producing country. But in 1878 New Orleans received more than a million bushels of wheat, and in 1879, 3,000,000. Last year its wheat receipts were as much as 6,000,000 bushels, and all for export, there being no milling at New Orleans.

* The report gives an account of the existing barge lines, and the number of tow-boats and barges owned by each. There are five of these lines, with an aggregate of 16 tow-boats and 103 barges, whose aggregate capacity is 4,865,000 bushels. It is said that they are able to carry 4,375,000 bushels to New Orleans monthly, which is at the rate of 52,000,000 bushels a year; but the state of the river will not permit their running all the time. Further, three of the barge companies have under construction 23 new barges, whose aggregate capacity will be 1,360,000 bushels. This is important not only as showing a larger capacity at an early day, but also as the best evidence that the business has been found profitable.

Further, this enormous grain-carrying capacity is provided at very little expense. The capital of the largest company, which has seven tow-boats and 48 barges, is but $200,000, or but little more than $5,000 per barge carrying 43,750 bushels, and the aggregate capital stock of four companies, with 15 tow-boats and 94 barges, is but $1,140,000, or an average of $11,053 per barge of 46,000 bushels capacity. Freight cars to carry 46,000 bushels, at present prices, cost about $65,000, or nearly six times as much as the average capital stock per barge. The report does not inform us whether any part of the capital of the barge lines is provided by bonds; but the whole stock is so exceedingly small that it seems improbable that they can have any considerable debts.

This cheapness of the barges is one of the most significant features of the business. The whole barge stock on the river, with capacity for carrying more than 4,000,000 bushels of grain to New Orleans when there is a favorable stage of water, seems to have cost no more than 25 miles of average railroad: and at this rate provision for carrying within three months all the grain shipped to Atlantic ports in the whole year 1880 could be provided for less than $30,000,000, or the cost of about 600 miles of average American railroad! The importance of this lies in the fact that with the uncertain navigation of the Mississippi, liable to be closed by ice for weeks and by low water for a large part of the season, boats might not be provided notwithstanding the cheapness of the movement if a large capital were required. It is easy to get millions to put into enterprises that can be kept at work, but not for such as are likely to lie idle a large part of the time; but if the above figures represent the whole cost of barges, they seem to be cheaper than storehouses and much cheaper than the farmers' granaries for storing an equal amount of grain. And this leads us to one consideration not referred to in the report. It has been proposed that the barges should serve as storehouses at any point on the river or its navigable tributaries where grain may be brought in sufficient quantities even for a partial load, remaining at the landing for that purpose for weeks if necessary. The tow-boat could pick them up as required and leave them on the return trip. Barge lines on the Hudson River are managed in this way. There would seem not to be the least necessity for a great grain-receiving market before reaching New Orleans, but the grain can be taken directly through from any landings which the boats can reach.

Mr. King's report also gives information of the rates charged by the barge lines from St. Louis to New Orleans. These last year seem to have averaged about 8½ cents a bushel, varying from 7 cents in the spring and summer (when lake rates were lowest) to 9½ cents. So far this year the rates are said to have been from 6 to 8½ cents. The lowest of these rates is no lower than the lake-and-canal rate has quite often been from Chicago to New York, and New York's advantage in the ocean rate would make the latter route much the best for export for all grain not very distant from the lakes. On the day for which Mr. King's report makes the comparison, New York had an advantage of about 9 cents a bushel in the ocean rate, but then the only way to New York was by rail, at the rate (from East St. Louis) of 24.3 cents per bushel, and it makes the total expense of shipping a bushel of wheat thence to Liverpool 28 cents by way of New Orleans, and 36 cents by way of New York. But the report gives the ocean insurance from New Orleans as only 1 cent per 100 lbs., against 0.9 cent from New York, though the voyage from New Orleans is one-half longer and much more dangerous; and New Orleans is credited with a charge of but ½ cent for elevating, against 2½ cents at New York, and there is not in the nature of things any reason why there should be any considerable difference, and if the competition becomes severe it is not likely that there will continue to be. At the present time the ocean rate from New York is but one-third as high as on the day selected for the comparison: but the latter was lower rather than higher than the average.

With the opening of the canal and lakes this route will compete directly with the barge lines for the grain exports, and with the heavy passenger traffic both ways on the Liverpool-New York steamers, we may be sure that the latter will get loads of grain, if they have to carry it at a cent or two a bushel. This northern water route will compete with the river route more strongly than the railroads can, and, if the lake vessels and canal boats cannot succeed without help, it is the railroads that carry from the West to the lakes that will have to help them. There are many reasons for thinking that the Canadian canals, when deepened as they soon will be, will secure a larger part

of the grain than the Mississippi route. In any event, the railroads will probably be effectually barred from "extortion" in this branch of their traffic.

THE MICHIGAN CENTRAL REPORT.

In many respects, the Michigan Central is like the Lake Shore, or rather like the half of the Lake Shore between Toledo and Chicago. It is a section of one of the great lines, and one of the greatest of the great lines, between New York and Chicago, and it is a Vanderbilt road, whose chief connection with New York, and especially with New England, is the New York Central, with which it is connected by no less than three roads across Canada, between Detroit and Buffalo. It was the first road to reach Chicago, and long was so superior to the Michigan Southern, now the western half of the Lake Shore, that it secured the larger share of the traffic to and from Chicago, though its ferry transfer at Detroit sometimes makes it inferior to a continuous rail route. But the Lake Shore has the great advantage that it intercepts the numerous roads coming from the vast and fertile country to the south and southwest of it, while to the north of the Michigan Central is only the limited peninsula between Lakes Huron and Michigan, most of which is covered with pine woods, and is thinly settled. The latter company has secured a large share of the Michigan roads, but the traffic which these contribute is trifling compared with that brought to the Lake Shore by such roads as the Wabash, the Cleveland, Columbus, Cincinnati & Indianapolis, etc., and though the Michigan Central has secured and kept a larger share of the Chicago business than any other road, it has comparatively little of that coming from St. Louis, Indianapolis, etc., and its through traffic is an unusually large proportion of its whole business.

The year 1880 was, however, one of the most prosperous in the company's history. Compared with 1879 there was an increase of 21.8 per cent. in gross and of 21.4 per cent. in net earnings, and the latter were so large as to enable the company to pay 8 per cent. dividends on its stock, which had received but 5½ per cent. from the earnings in 1879, 4 in 1878, and nothing for five years previous. The gross earnings, expenses and net earnings for ten years have been:

Year.	Gross earnings.	Expenses.	Net earnings.
1870–71	$5,420,123	$3,861,011	$1,559,112
1871–72	6,441,413	4,447,803	1,993,610
1872–73	7,302,118	4,989,955	2,312,163
1873–74	7,634,081	5,523,642	2,110,439
1874–75	7,102,286	5,068,097	2,034,189
1875–76	6,850,964	4,802,902	2,048,062
1876–77	6,498,127	4,706,442	1,791,685
1877 (7 mos.)	3,903,514	2,591,015	1,312,499
1878	6,872,094	4,347,239	2,504,855
1879	7,346,794	4,699,592	2,647,202
1880	8,951,375	5,738,751	3,212,624

In the first of these years the road worked but 586 miles of road, for the second, 719; but since that time its length has been substantially unchanged; the capital stock was increased about $4,000,000 (28 per cent.) in 1871–72, and an addition of about $7,000,000 (more than 100 per cent.) has been made to the funded debt since that time. Thus it is that net earnings which were sufficient to meet all charges and pay 8 and 10 per cent. dividends down to 1872–73, afforded no dividends after that; and it is only since these net earnings have increased largely, in the last three years, that dividends could be resumed. The capital is so much larger that it requires a larger income to pay interest on it.

We see from the above table that gross earnings, expenses and net earnings all were larger last year than ever before, the amount of increase in the latter over 1879 alone being equivalent to nearly 3 per cent. on the stock. The increase in earnings and profits was in accordance with the general course of things that year, but it will be worth while to analyze itssources.

The traffic of the road last year was the largest it has ever had; but as we remarked last week of the Lake Shore, the gain in freight was much smaller than for several years previous, while the gain in passengers was very large. The course of these two branches of traffic for four years is traced below, with percentage of the increase or decrease of the traffic of each year compared with that of the previous year:

Year.	Ton-miles.	P. c. of	Passenger-miles.	P. c. of
1877	446,708,639	.....	89,805,454	.....
1878	548,053,707	I. 22.7	79,684,072	D. 11.4
1879	721,019,413	I. 31.6	93,232,430	I. 17.0
1880	735,611,995	I. 2.0	115,523,789	I. 23.9

The increase in freight traffic, which in the two years previous was over 22 and 31 per cent., respectively, was comparatively a trifle in 1880, while the passenger traffic increased very largely and was 45 per cent. more than in 1878.

But if we turn to the earnings, we find that though the increase in freight traffic was but 2 per cent., the increase in freight earnings was 24¼ per cent.; while the increase in passenger earnings (19 per cent.) did not keep pace with the increase in passenger traffic (24 per cent.). The reason, of course, is that average passenger rates were lower and average freight rates higher. Our abstract of the report shows these average rates for four years, and we find that the continuous decrease in the average receipts per ton per mile, which had brought it down from 1.03 cents in 1875–6 to 0.692 cent in 1879, was arrested in 1880, when there was an advance of nearly a quarter over 1879.

Now if the average receipt on freight had been as low in 1880 as in 1879, this business would have yielded but $4,989,454, instead of $6,195,971, and the net earnings of the company would have been $1,206,500 less than they actually were, and would have been $641,000 *less* instead of $565,000 more than in 1879. Thus the improvement in the company's profits and in the stockholder's income was wholly due to the higher freight rate, which indeed, such was the increase in expenses, presented a reduction of profits equal to 3.4 per cent. on the stock.

The statement of traffic statistics, moreover, enables us to see just what traffic it was that bore those higher rates. It was the through traffic entirely, and chiefly the through freight east-bound. On local freight there was a slight reduction in the average rate, but the advance in the east-bound through added $728,838 to the freight earnings and the advance in west-bound $88,605. On this road the average rate is much less on west-bound than on east-bound freight—contrary to what has been common—and this is doubtless due to its carrying much coal and similar freight in grain cars in competition with the lake vessels.

Further, an examination of the report of freight movement shows that the small increase in ton miles in 1880 was due wholly to local freight. In through freight there was a decrease in both directions—7¾ per cent. in east-bound and ½ per cent. in west-bound. The Lake Shore's report showed a decrease of 1½ per cent. in east-bound, but an increase of 25 per cent. in west-bound through, and its west-bound has become equal to 57 per cent. of the east-bound, while the Michigan Central's west-bound is still but 47 per cent. of its east-bound, though its average west-bound rate is one-third less than the Lake Shore's. The explanation is probably that the Lake Shore gets a much larger merchandise freight, owing to its numerous connections with roads to the south of it.

The growth of the passenger traffic extended to all branches of it. Through east increased one-third, through west one-quarter, emigrant (which is also through west) 43 per cent., and local 13½ per cent. The emigrant traffic was one-fifth more than all the other through passenger traffic westward. An unusually large proportion of this road's passenger traffic is through—in 1879 50½ per cent., and in 1880 54½. The local passenger traffic, however, contributed 56 per cent. of the passenger earnings last year, and nearly 60 per cent. the year before.

The road is a favorite passenger route, and it appears to get its full share of the business; and a good deal is to be hoped from its increase during these prosperous times. But as with other roads, its chief dependence is upon freight, and that is the traffic that grows rapidly. We see that the growth of the through traffic, as on the Lake Shore, was arrested last year as the rate was advanced, though the wonder is that it should have remained so large with so great an advance. This proved at least that there may be an enormous traffic at a paying rate. To maintain a paying rate, as we have shown above, is absolutely essential to the continued prosperity of this company, 70 per cent. of whose freight traffic last year and 77 per cent. in 1879 was through. A return to the era of railroad wars would be eminently disastrous to it, as to most of the through lines.

Opening of Lake Navigation.

Lake navigation opened May 3, on which day the steam barge Garden City passed through the Straits of Mackinaw on a trip from Chicago to the Lake Huron port Alpena. It does not appear that so early an opening was expected, for we believe there were no other clearances from Chicago or Milwaukee for the lower lakes until the 4th, after the news of the Garden City's passage was received. Of course the separate lakes were open earlier, though unusually late. There has been considerable lumber traffic between Lake Michigan ports, and a few trips on Lake Erie, though Buffalo harbor was closed nearly as long as the Straits, the first vessel (from Erie) working its way in April 30, and the first clearances being on May 2, and these having some trouble in getting through the ice near the harbor. Lake Superior is still closed. The opening seems not to have the usual effect in stimulating shipments; although these have been considerable, it would appear that a considerable number of vessels at Chicago did not get cargoes until some time after the opening, though lake shipments were stimulated by a strike of the switchmen which prevented rail shipments. Moreover, the opening rate from Chicago to Buffalo was 5 cents per bushel on wheat, and the wheat rate is usually half a cent higher than the corn rate. Rates have been reported for very few vessels, which is a further indication that they are weak. Last year navigation opened April 3, or just one month earlier, and the opening rate was 6½ cents a bushel for wheat and 6 cents for corn—about a quarter higher than this year. Notwithstanding the late lake opening, the stocks in lake elevators were not so great as last year and there was nothing like such a pressure to ship. The March receipts at Chicago had been exceptionally great last year (twice as great as this year), and nearly twice as great as the receipts of the month previous to the opening of navigation have been this year. And the circumstances now do not favor the continuance of high rates. The receipts at lake ports are not heavy, and they are not likely to be as heavy as in May last year (when indeed they were the largest ever known in a spring month), because the late spring will keep the farmers in their fields during May doing the work which last year they did in April. The movement this year corresponding to the heavy May movement last year we cannot expect until June, or thereabout. Further, the more numerous barge lines on the Mississippi will compete with the lake vessels to a greater extent than heretofore. They have not so far carried much grain while lake navigation is open, but of course they will be sure to carry throughout the season so long as they can make the least profit; and will lower their rates down to the point that just covers expenses, if necessary to get cargoes. It will be very interesting to see the result. Their weakness, we imagine, will be in the inability of the vessels between New Orleans and Liverpool to compete with those between Eastern ports and Liverpool, which during the past week have been carrying at two to four cents a bushel. Very likely lake rates will sink until June, or such time as the receipts from the country become heavy, and then become firm; and in anticipation of the heavy movement a few weeks later, it will probably be good policy for the railroads to maintain their 30-cent rate, even if they get very little grain for a time. If, however, the business is so divided between lake and river *after it becomes heavy* that the lake (and canal) rates are kept very low—say as low as 9 or 10 cents a bushel through from Chicago to New York, then the railroads will probably have to reduce the current rate or give up carrying grain for export; and if so, then there is much to be said in favor of making the reduction by means of a general rebate on grain exported.

As the Erie Canal does not open until the 17th, there will be time for a great deal of grain to arrive at Buffalo before the canal can take it. Meanwhile the Welland Canal is already open, and the railroads east of Buffalo will doubtless profit by the occasion to carry as much as possible. A reduction in tolls has been made on the Canadian canals, which is expected to stimulate shipments to Montreal: but it is not likely to have anything like as great an effect as the deepening of these canals, which is to be completed next season, we believe.

With these three water routes in full operation, the railroads are not likely to get very fat on the business of grain, carrying between the Mississippi and the East, and they may have to practice a great deal of ingenuity in order to secure any considerable share of the export grain at rates that will yield any profit.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Northern Pacific.—The *Puyallup Branch* is extended from Wilkeson, Wash. Ter., to Carbonado, 3 miles.

Richmond & Allegheny.—Extended eastward to North River, Va., 16 miles.

Toledo, Delphos & Burlington.—The *Dayton Division* is completed by laying track from Celina, O., south to Versailles, 24 miles. Gauge, 3 ft.

Arlington & Pimlico.—Completed from Arlington, Md., to Pimlico, 4 miles.

Crève Cœur Lake.—Completed from Laclede station north to Crève Cœur Lake, Mo., 20 miles.

Atchison, Topeka & Santa Fe.—Extended from Ft. Thorne, N. M., southward to Mesilla, 45 miles.

This is a total of 112 miles of new railroad, making 1,018 miles this year, against 1,264 miles at the corresponding time in 1880, 493 miles in 1879, 312 miles in 1878 and 354 miles in 1877.

MARCH IMPORTS AND EXPORTS at the several ports of the country illustrate how much more the imports are concentrated than the exports. The ports through which as much as 1 per cent. of either imports or exports were made were as follows:

	Per cent. of imports.	Per cent. of exports.
New York	69.4	41.8
Boston	9.4	9.0
Philadelphia	5.8	5.2
San Francisco	5.6	3.6
Baltimore	2.1	8.9
New Orleans	1.8	12.2
Savannah	0.1	4.7
Galveston	0.4	4.1
Charleston	0.1	3.1
Norfolk	....	1.6
Mobile	....	1.3
	94.7	95.5

The total imports of all the Southern ports (all south of Baltimore) were less than $1,730,000—not three per cent. of the whole—though their exports were $23,720,000, or nearly 29 per cent. of the whole. It is often said that if a port once succeeds in establishing a large, export business, the vessels coming to it for cargoes will bring it a large import business; but in fact there seems to be very little connection between the two. An established import trade it is very

difficult to destroy, and to establish one on our Atlantic coast seems now almost impossible. Baltimore has created its large export business within comparatively few years, but its imports remain light: and New Orleans, Galveston, Savannah and Charleston, which make large exports, and have for many years, import little more than our lake ports, which receive only Canadian products. The commercial importance of Boston is due largely to its import business, which was established before the revolution, and is to-day nearly as great as that of Philadelphia, Baltimore and New Orleans together.

The imports of New Orleans and Galveston are likely to be considerably increased this year by unusual orders for English rails for Southern and Southwestern railroads that can be delivered there with much less expense for freight than if brought by way of ports further north.

NEW ORLEANS GRAIN RECEIPTS during the last week of April reached the unprecedented amount of 1,478,638 bushels—nearly twice as much as in any other two weeks of the year, and about two-fifths more than the largest previously reported, which were in the last week of January, 1880. They are larger receipts than Baltimore has had in any week since last October, and with four exceptions larger than any week's receipts in Philadelphia in 1880, and but a fifth less than New York's receipts the same week. New Orleans receipts fluctuate greatly from week to week, but that is largely due to the limited number of barge lines—in some weeks no tow seems to arrive, and in others two or three. For instance, the week before that of these large receipts, but 238,000 bushels—only a sixth as much—arrived. Hitherto half a million bushels have been a large week's receipts at New Orleans, and until last year there were but four weeks (at least of late years) when receipts had been so large. There was no such week either in 1876 or 1877; since 1877 the weeks in which more than half a million bushels were received have been as follows:

Week ending.	Bushels.	Week ending.	Bushels.
Feb. 2, 1878.....	735,167	May 1, 1880.....	520,474
Feb. 9, "	601,445	July 10, "	553,426
March 22, 1879.....	678,008	Sept. 11, "	658,663
Dec. 20, "	718,270	" 18, "	592,117
Jan. 31, 1880.....	1,120,063	Oct. 2, "	642,325
March 13, "	508,786	March 12, 1881.....	673,913
April 3, "	545,383	" 26, "	703,731
" 10, "	560,039	April 2, "	907,361
" 17, "	706,644	" 16, "	697,450
" 24, "	565,652	" 30, "	1,487,638

Every week last year the receipts exceeded half a million bushels, and though in none were they nearly so great as in two April weeks of this year, yet for the five weeks ending May 1 last year (in all of which the receipts exceeded 500,000 bushels), the aggregate New Orleans receipts were 2,898,172 bushels), against 3,472,611 this year. These April receipts last year were the largest the city had ever had, as the April receipts are this year. The gain in April this year, however, does not yet make the receipts of the four months ending with April as large as they were in 1880 by nearly 1,500,000 bushels. A very few more weekly receipts like the last, however, will soon change the balance, and with the number of barge lines now on the river, and the present good stage of water, we may expect to see a heavy movement down the river continue, unless lake and canal rates are low enough to divert it.

AN EMPLOYÉS' RECORD is provided for by the following circular from Mr. R. Andrews, General Superintendent of the Eastern Division of the Wabash, St. Louis & Pacific Railway, which is directed to "heads of departments:"

"It being manifestly to the advantage of the company that all employés should feel interested in its success and future prosperity, and as an evidence of its appreciation of the valuable services of its competent employés, I desire that you will hereafter keep a record in your office of the entry into the service of the company of each employé—specifying date employed, name, position, by whom recommended—and thereaftera history of their services, and furnish this office from time to time with a duplicate of the records of each employé. It being our intention and wish that each competent and worthy employé should be promoted whenever an opportunity should occur, and that all worthy employés should feel encouraged to remain in our service, I wish that you would personally interest yourselves in their advancement and encourage them to become interested and identified, as it were, in our service.

"A friendly word of encouragement and a kindly expression of interest in their welfare will greatly benefit both them and the service of the company."

This plan will provide something like the "descriptive roll" that is made for every soldier in the army, and which is sent with him whenever he is transferred from one command to another, to hospital or elsewhere, and a copy of which he receives when he is discharged. It notes every service in which he may have been distinguished, his furloughs, time in hospital, arrests, punishments, etc. Something like it is provided by law for mechanics and others in some European countries, and when a man applies for employment he produces this record of his life and services; and, moreover, his employer must fill up his record during his employment, and give him a copy of it. When the officers of railroads change so frequently as they do on our railroads, and indeed, in any large organization, there is no other way possible of preserving accurate knowledge of the capacity, service and deserts of employés, and thus of making the best use of them, not to say of doing justice when promotions are to be made, and the like.

THE DEATH OF BARON VON WEBER is confirmed by the mails of the past week, and from the leading German railroad journal we translate a sketch of his life which is especially interesting as showing how thorough a training he received, not only technical, which too commonly is considered all that is desirable, but general, and both practical and theoretical. It was one of his own arguments that a principal reason why engineers in Germany failed of the influence which a body of professional technical experts ought to exert on society and the state was, because their training is too exclusively technical: they do not fully comprehend the world they live in, and their relation to it. We are told that Weber had a "thorough classical education" before he began his professional studies, and that afterwards he attended the Berlin University lectures on natural science and political economy. We happen to know that he especially valued this general training, and he always urged that whatever education is best fitted to train men generally should be acquired by engineers as well as by members of other professions.

Weber's last work, finished the very day he died, will be his report on the canals and the narrow-gauge railroads of this country. As regards the latter, we imagine it will not be very flattering: most of our narrow-gauge railroads are not such as would be selected by ourselves as favorable specimens of our roads. He was, moreover, dissappointed in getting the information he desired concerning them, and the knowledge he acquired concerning our railroads as a whole, while here, was quite meagre. His observations, however, as an extremely well-informed traveler, are likely to be interesting. He had great faith in the future of this country, and in the effectiveness of individual enterprise untrammeled by government regulations to develop industry.

APRIL EARNINGS, as reported by 42 roads (several of them for three weeks only), show an increase in the aggregate of 23⅜ per cent., but made with 17½ per cent. more miles of road, and the average earnings per mile increased from $428 to $450, or about 5 per cent. April earnings last year were comparatively not so large as March earnings, the gain of the 56 roads reported in our table then being 14¼ per cent., while in March it was 20 per cent. In fact this year's April corresponds with last year's March in many ways. March was the month before the opening of navigation last year, as April has been this year; the heaviest grain movement was in March last year and in April this, and the merchandise movement westward, and especially the lumber movement, has been later this year. We see that March earnings this year showed a decrease of 6 per cent. per mile of road, while the April earnings so far reported show an increase. If we follow out the parallel, we will have to prophesy a comparatively dull May business, the shipments of produce, which came in enormous quantities to the lake ports and other Northwestern markets last year, being postponed three or four weeks, literally on account of the weather—not on account of the weather of May, but because the weather of March and April was such that the work of those months has largely to be done in May, and that work will leave little time for the marketing of grain. It will not, however, prevent the free shipment of the stocks that have accumulated either at lake ports or at the country stations, and that possibly, may afford a good business. It has not done so heretofore, however, May traffic so far in some important branches having been light.

THE CUNARD STEAMSHIP LINE, which is one of the best known in the world and the oldest now plying between New York and Liverpool, after having been run as a private concern for 40 years, last year was made a joint stock company, "The Cunard Steamship Company." This company has recently issued its first annual report, covering the year 1880. The company owns a fleet of 32 vessels, with an aggregate capacity of 61,379 tons, and with 38,903 effective horse-power. The gross earnings during the year were £1,138,389, the working expenses £847,736, the repairs and renewals £81,238, and the insurance paid £26,029, or a total of £955,003, or 84 per cent. of the earnings; leaving £183,386 as net profits from operation, which is at the rate at £5,731 per vessel, £3 (nearly) per ton of capacity, and £4.7 per horse-power. The capital stock of the company is £1,600,000, or at the rate of £50,000 per steamer and £26 per ton of capacity, which makes a Cunard steamer cost about two and a half times as much as freight cars enough to hold the same tonnage. The gross earnings of the line were at the rate of £35,575 per steamer, and £18 or about $90 per ton of capacity. The company paid 6 per cent. on its stock out of the 1880 earnings, but an amount nearly as great as the dividend was charged for depreciation and sinking fund, and there was then a surplus equal to more than 1 per cent. on the stock.

Besides the fleet named, since the close of the year the Cunard Company has received the 8,000-ton "Servia," recently launched, and very soon will have the "Catalonia," of 5,000 tons, and has ordered three other new steamships; two of 5,000 and one of 7,000 tons.

OCEAN RATES have been down recently to the lowest figures for years, for a week or more steamers taking grain from New York to Liverpool at 2d. per bushel as a maximum, and down to 1½ and even 1d. at times—which is a pretty low freight for a distance of 3,000 miles. It is not, however, the lowest rate ever known. The *Produce Exchange Weekly* says that there have been instances where grain has been taken for nothing, the vessel paying all existing charges. This was probably when the vessels had a paying cargo of bulkier freight, and needed a cargo to stow in the hold in lieu of ballast. In spite of the low rates exports are very light—or rather this probably causes the low rates. There is such a current of immigrants coming this way and first-cabin tourists going the other that the steamers would probably continue to flock to the port if there was no freight, and in such cases they will take anything they can get. It costs now, exclusive of the transfer at New York harbor, 21 to 22 cents a bushel to carry wheat from Chicago to Liverpool, all the land carriage being by rail.

CHICAGO TRAFFIC, and especially its shipments by rail eastward, were greatly reduced by the switchmen's strike last week. During the last week of April the east-bound shipments by rail from Chicago were 62,812 tons, an average of 10,469 tons daily; in three days of last week the daily shipments were 2,102, 2,370 and 2,589 tons respectively. Probably there was some falling off because of the opening of lake navigation during the week, but most of it, doubtless, is caused by the strike. Very few trains can be dispatched, however much traffic may be offered.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

St. Louis, Alton & Terre Haute, annual meeting, at the office in St. Louis, June 6.

Chicago & Northwestern, annual meeting, at the office in Chicago, June 2. Transfer books closed April 30.

Chicago, Milwaukee & St. Paul, annual meeting, at the office in Milwaukee, June 4. Transfer books close May 19.

Technical Conventions.

The *Railway Purchasing Agents' Association* will hold its annual meeting in St. Louis, May 17.

The *Car Accountants' Association* will hold its annual convention at the Grand Hotel in Cincinnati, May 25.

The *Master Mechanics' Association* will hold its fourteenth annual convention in Providence, R. I., beginning Tuesday, June 14. Headquarters for members will be at Narragansett Hotel.

The *Master Car-Builders' Association* will hold its fifteenth annual convention in the city of New York, beginning June 14.

The *American Society of Civil Engineers* will hold its thirteenth annual convention in Montreal, Canada, beginning June 15.

Dividends.

Dividends have been declared as follows:

Nashua & Lowell, 4 per cent., semi-annual, payable May 2.

New York, Providence & Boston, 2 per cent., quarterly, payable May 10.

Cleveland & Pittsburgh (leased to Pennsylvania Company), 1¾ per cent., quarterly, payable June 1.

Catawissa (leased to Philadelphia & Reading), 3½ per cent., semi-annual, on the preferred stock, payable May 18.

Pennsylvania, 4 per cent., semi-annual, payable May 28 to women only: to all other stockholders May 30. Transfer books closed April 30.

Boston, Concord & Montreal, 3 per cent., semi-annual, on the preferred stock, payable May 9.

Delaware & Hudson Canal, 1½ per cent., quarterly, payable June 10. This is the first dividend for several years.

Master Car-Builders' Association.

The following circular has been issued to members:

"The fifteenth annual meeting of the Master Car-Builders' Association will convene in the city of New York June 14, 1881. The Committee of Arrangements have selected the Park Avenue Hotel as the headquarters of the Association, and have made favorable arrangements with the proprietor for their entertainment. Board, $3 per day. Persons wishing to engage rooms will communicate with the proprietor of the Park Avenue Hotel, stating the number of persons for whom accommodations are desired.

"We trust that you will spare no effort to meet with us at the time named. Yours truly, C. A. SMITH, Secretary.

"C. A. SMITH,
"WILLIS DAVIS, } Com. of Arrangements."

American Institute of Mining Engineers.

Professor Thomas M. Drown, Secretary of the Institute, has issued the following announcement in relation to the Virginia meeting:

Monday, May 30—Opening session in the Staunton Opera House at 8 o'clock, p m.

Tuesday, May 31—Sessions of the Institute at 9 o'clock, a. m., at 3 o'clock and 7:30 p. m. At 1:30 p. m. an excursion will be made in carriages about the city, visiting the water works and public institutions.

Wednesday, June 1—Excursion over the Shenandoah Valley Railroad, visiting the Shenandoah Iron Works, Luray Cave, and other points of interest.

Thursday, June 2—Excursion over the Chesapeake & Ohio Railroad, visiting Ferrol, Longdale, Clifton Forge, Low Moor, and arriving at White Sulphur at 5:30 p. m. Session of the Institute at 8 p. m.

Friday, June 3—Excursion over the Chesapeake & Ohio Railroad to the New River coal fields, visiting Quinnimont, Stone Cliff, Fire Creek, Sewell, Nuttallberg, and Hawk's Nest, where an opportunity will be given for a thorough examination of the Ansted coal mines; then through the Kanawha coal fields to Coalburg, returning to White Sulphur for the night.

Saturday, June 4—Excursion over the Richmond & Allegheny Railroad from Williamson to Balcony Falls, visiting the Natural Bridge of Virginia and returning to Williamson in time to take the trains East and West.

It is necessary that members should inform the Secretary of the Institute *promptly* of their intention of being present at the Staunton meeting, in order that certificates may be sent to them for the purchase of such excursion tickets as may be issued by the different railroad companies, and also that accommodations may be prepared for their comfort during the meeting.

Members are requested to give early notice to the Secretary of the papers they intend to present at this meeting, that they may be announced in a subsequent circular. It is expected that the discussion on steel rails, begun at the Philadelphia meeting, will be continued.

ELECTIONS AND APPOINTMENTS.

Allegheny Valley.—The board has re-elected John Scott President: T. F. Robinson, Secretary and Treasurer; T. F. Brown, Auditor; David McCargo, General Superintendent. E. H. Utley, General Freight and Passenger Agent; Thomas M. King, Superintendent River Division; C. A. Jackson, Superintendent Low-Grade Division.

Ashuelot.—At the annual meeting in Keene, N. H., recently, the following directors were chosen: A. B. Harris, Oscar Edwards, J. A. Rumrill, Tilly Haynes, Henry Colony. The board elected A. B. Harris, President; F. F. Lane, Treasurer. The road is worked by the Connecticut River Company.

Bangor & Portland.—At the annual meeting in Bangor, Pa., May 3, the following directors were chosen: Joseph Bray, Dr. John Buzzard, J. E. Long, G. W. Mackey, Conrad

Miller, John I. Miller, Jonathan Moore. The board elected Conrad Miller President; G. W. Mackey, Secretary; John I. Miller, Treasurer.

Boston, Revere Beach & Lynn.—Messrs. Matthew Bolles and L. S. Judd have been chosen directors to fill vacancies in the board.

Canada Central.—The following circular from the General Manager is dated Brockville, May 11: "Mr. C. W. Spencer has been appointed Traffic Superintendent of this company, to take effect from above date. His headquarters will be at Brockville until further notice. The movement of freight and of trains, the control and supervision of train-men, and all matters in this connection, will be under his direction, and all correspondence relating to such matters must be addressed to him as above. Train orders will be signed by him, and replies thereto must be addressed to him; and all orders and instructions issued by him, relative to any and all matters pertaining to his department, must be respected and obeyed by all employés. Casualty and train reports, station time-rolls, requisitions for train supplies and car tracers must be sent in to him in the usual course."

Carolina Central.—This company has re-elected the old officers, as follows: President, D. R. Murchison; General Superintendent, V. Q. Johnson; Treasurer, James Anderson; Auditor, W. N. Bowden; General Freight and Passenger Agent, F. W. Clark. Offices at Wilmington, N. C.

Cedar Rapids, Iowa Falls & Northwestern.—This company has elected officers as follows: President, Geo. J. Boal, Iowa City, Ia.; Vice-President, J. N. Dewey, Iowa City; Secretary, W. H. Brady, Cedar Rapids, Ia.; Treasurer, C. Stickney, Cedar Rapids.

Chicago & Grand Trunk.—Mr. S. R. Callaway has been appointed General Superintendent and the office of General Manager is abolished. Mr. Callaway has served on the Detroit & Milwaukee and the Detroit & Bay City.

Mr. Charles B. Peck, late General Manager, has been appointed General Traffic Manager, and will have charge of all the western traffic of the Grand Trunk.

Chicago, Milwaukee & St. Paul.—Mr. W. A. Givin has been offered the position of Car Accountant, in place of J. P. Beecham, who will remain with the company in a new office, having charge of all movement of rolling stock.

Chicago, Rock Island & Pacific.—Mr. F. A. Marsh has been appointed Purchasing Agent, in place of Allen Manvel, resigned. The office of Assistant General Superintendent also held by Mr. Manvel) is abolished.

Crève Cœur Lake.—The officers of this company are: H. A. Stevens, General Manager; J. H. Posey, Passenger and Ice Agent.

Delaware & Hudson Canal.—At the annual meeting in New York, May 10, the following directors were chosen: Thomas Dickson, Scranton, Pa.; Thomas Cornell, Kingston, N. Y.; John Jacob Astor, Legrand B. Cannon, David Dows, James M. Halstead, Adolphus Hamilton, Robert S. Hone, Hugh J. Jewett, Abiel A. Low, James Roosevelt, James R. Taylor, Abraham R. Van Nest, New York. Messrs. Dows and Jewett are new directors, succeeding Levi P. Morton and George Cabot Ward. The board re-elected Thomas Dickson, President.

Delaware River.—At the recent annual meeting in Woodbury, N. J., the following officers were chosen: President, Wm. S. Cooper; Secretary, Samuel T. Miller; Superintendent, Edward H. Green.

Eastern.—Mr. Amos Pillsbury has been appointed Superintendent of Rolling Stock. He was formerly Master Mechanic of the Hartford, Providence & Fishkill and for some time past has been Master Mechanic of the Valley Railroad, of Ohio.

Evansville Belt.—The directors of this new company are: Wm Heilman, D. J. Mackey, James Montgomery, E. S. Babcock, Jr., F. J. Reitz, C. R. Bement, E. J. Martin. Office in Evansville, Ind.

Grand Trunk.—Mr. Wm. Wainwright, General Passenger Agent, has been appointed Assistant Traffic Manager. He will, for the present, retain charge of the Passenger Department.

Houston & Texas Central.—At the annual meeting in Houston, May 2, the following directors were chosen: E. W. Cave, G. Jordan, A. Groesbeck, A. Richardson, Houston, Tex.; Charles Fowler, Galveston, Tex.; A. C. Hutchinson, Charles A. Whitney, New Orleans; John J. Cisco, R. J. Morgan, New York

Illinois Central.—The following appointments are announced: Road-Master, North Division, Peter Rockwell; Train Master, Amboy Section, G. W. Freeman; Train-Master, Waterloo and Ft. Dodge sections, J. L. Turner.

Indiana, Bloomington & Western.—Mr. C. L. Dickinson has been appointed Auditor, and entered upon his duties May 2.

Mr. C. E. Henderson has been appointed Assistant General Manager in charge of the Ohio Division, late the Cincinnati, Sandusky & Cleveland road. Mr. D. W. C. Brown is appointed Superintendent of the Ohio Division. All subordinate officers retain their positions, but business with other companies will be transacted through the general offices in Indianapolis.

Iowa City & Western.—This company has elected the following officers: President, Lyman Cook; Vice-President, J. N. Dewey; Secretary, Theo. Stickney; Treasurer, C. Stickney.

Little Rock & Ft. Smith.—At the annual meeting at Little Rock, April 28, the following directors were chosen: W. M. Fishback, Ft. Smith, Ark.; Jesse Turner, Van Buren, Ark.; S. F. Clark, D. E. Jones, W. D. Slack, Little Rock, Ark.; Elisha Atkins, J. H. Converse, F. Gordon Dexter, F. M. Weld, Boston. The only new director is Mr. Dexter, who succeeds F. H. Perkins. The board re-elected J. H. Converse, President; Jesse Turner, Vice-President; J. W. Gay, Secretary; Joseph Kampmann, Treasurer.

Little Rock, Mississippi River & Texas.—At the annual meeting in Little Rock, April 28, the following directors were chosen: Elisha Atkins, J. E. Redfield, E. Winchester, F. Gordon Dexter, Pendall, Griffith, Wilkins, Tillor, Penzell. The board elected Elisha Atkins President; George S. Daniels, Treasurer; J. A. Woodson, Secretary and Superintendent. Mr. Atkins succeeded Mr. Redfield as President.

Louisville & Nashville.—The office of L. B. Jones, General Eastern Agent, has been removed to No. 381 Broadway, New York.

Mexican National.—The present headquarters of A. M. Wellington, Principal Assistant Engineer, are at Morelia, in the state of Michoacan.

George H. Birnie, late Division Engineer on the Wheeling & Lake Erie, is an Assistant Engineer in charge of a party engaged in surveys of this company's Manzanillo & Laredo line, with address at Morelia.

Michigan Central.—At the annual meeting in Detroit, May 5, the old board was re-elected, as follows: Anson Stager, Chicago; Ashley Pond, Detroit; William L. Scott, Erie, Pa.; Samuel F. Barger, Augustus Schell, William H. Vanderbilt, William K. Vanderbilt, Cornelius Vanderbilt, E. D. Worcester, New York. The board re-elected William H. Vanderbilt President; Cornelius Vanderbilt, Vice-President and Treasurer; E. D. Worcester, Secretary.

Minneapolis & St. Louis.—The officers and directors chosen for this company as consolidated are: President, W. D. Washburn; directors, H. T. Welles, J. K. Sidle, W. D. Hale, C. H. Pettit, A. H. Bode, W. W. McNair, R. J. Baldwin, M. P. Hawkins; Secretary, M. P. Hawkins; Treasurer, A. H. Bode.

Mr. A. H. Crocker has been appointed General Superintendent of the road. He was recently on the Chicago, Burlington & Quincy.

New York & New England.—Mr. Eustace C. Fitz, of Boston, has been chosen a director, in place of W. O. Taylor, deceased.

New York, Pennsylvania & Ohio.—Mr. James McIntyre has been appointed Superintendent of Buildings and Bridges, *vice* Joseph Hallar, resigned, appointment taking effect April 1.

New York Stock Exchange.—At the annual election held May 9 the following officers were chosen for the ensuing year: President, Donald Mackay; Chairman, James Mitchell; Vice-Chairman, Alexander Henriques; Treasurer, D. C. Hays; Secretary, B. O. White; Trustee of Gratuity Fund, William Alexander Smith; Governing Committee, to serve four years, S. T. Russell, G. L. Haight, E. Brandon, F. K. Sturgis, W. L. Bull, F. N. Lawrence, Simeon J. Drake, R. L. Anderton, Jr., J. S. Decker, J. D. Probst; to serve one year, D. A. Boody.

North Carolina Midland.—The officers of this company are: President, J. S. Barbour, Alexandria, Va.; Vice-President, J. Turner Morehead, Leaksville, N. C.; Secretary and Treasurer, J. W. Albaugh, Salem, N. C.

Ohio Southern.—At a meeting in Springfield, O., recently, the following directors were elected: B. S. Henning, Austin Corbin, J. R. Maxwell, Henry Graves, Dumont Clark, Alfred Tully, New York; O. S Kelly, Amos Whitley, Geo. H. Frey J. H. Downey, Ford Woods, Springfield, O.; H. L. Chapman, Jackson, O. At a subsequent meeting Major Henning was elected President.

Oregon & California.—The board has elected Henry Villard President, in place of R. Koehler, resigned. Also A. G. Cunningham and C. E. B. Robertson directors, in place of C. H. Lewis and Paul Schulze, resigned.

Pennsylvania Company.—The following appointments are announced by General Passenger Agent E. A. Ford: Mr. Robert Emmett, District Passenger Agent for Terre Haute & Indianapolis Railroad, and Passenger Agent for the Pittsburgh, Cincinnati & St. Louis Railway, and the Jeffersonville, Madison & Indianapolis Railroad, the appointment to take effect May 1, 1881. His office will be at Indianapolis, Ind., and his district will include all territory within the following described circle of cities and towns: Logansport, Frankfort, Colfax, Crawfordsville, Guion, Terre Haute, Vincennes, Evansville, New Albany, Jeffersonville, Madison, Lawrenceburg, Hamilton, Richmond, Winchester, Ridgeville, Portland, Decatur (Ind.), Bluffton, Wabash, North Manchester, Denver and Peru. All local or traveling passenger agents, employed by either of the three lines named above, within the district described will report to and be instructed by Mr. Emmett. Mr. Frank M. Caldwell, District Passenger Agent of the Pittsburgh, Cincinnati & St. Louis Railway Company, with his office at Columbus, O. His district will include all territories within the following described circle of cities and towns: Richmond, Hamilton, Morrow, Batavia, Newport, Portsmouth, Gallipolis, Pomeroy, Parkersburg, Marietta, Cambridge, Newcomerstown, Mt. Vernon, Galion, Marion, Bellefontaine, Sidney, St. Marys, Mercer, Decatur, Portland, Ridgeville and Winchester. All local or traveling passenger agents employed by this company within the district described above will report to and be instructed by Mr. Caldwell. Messrs. Caldwell and Emmett will report to C. C. Cobb, Assistant General Passenger Agent at Cincinnati, in regard to Panhandle matters. Mr. Emmett will report to J. M. Chesbrough, St. Louis, concerning Vandalia, and to H. R. Dering, Louisville, concerning the Jeffersonville road.

Pittsburgh, Virginia & Charleston.—The following have been elected: President, J. N. DuBarry; directors, George B. Roberts, Edmund Smith, Wistar Morris, John P. Green, Strickland Kneass, D. A. Stewart, Chas. E. Speer, W. J. Howard, George V. Lawrence, John Scott, T. L. Daly, Joseph Walton. The road is leased to the Pennsylvania.

Pullman Southern Car Co.—At the annual meeting in Louisville, May 11, the following directors were chosen: George M. Pullman, George F. Brown, C. H. Davie, R. B. Bullock, M. Burns, A. M. Quarrier, E. D. Standiford, W. C. Hite, W. F. Harris. The board elected George M. Pullman President; George F. Brown, First Vice-President; W. C. Hite, Second Vice-President; A. S. Weinsheimer, Secretary; C. H. Davie, Accountant: Thomas Hayes, General Superintendent.

St. Croix & Northwestern.—At a meeting in St. Croix Falls, Minn., the following officers were elected: President, William M. Blanding; Vice-President, Charles E. Mears; Secretary, A. C. Henderson; Treasurer, Joel F. Mason.

St. Louis, Salem & Little Rock.—At the late annual meeting in Salem, Mo., the following directors were elected: A. L. Crawford, W. L. Scott, H. A. Crawford, Joseph McCarter, E. L. Foote.

St. Paul & Duluth.—Messrs. J. J. Hill and R. B. Angus have been chosen directors, in place of C. H. Graves and J. Q. Adams, resigned. Mr. Hill is General Manager and Mr. Angus Vice-President of the St. Paul, Minneapolis & Manitoba.

St. Paul, Minneapolis & Manitoba.—The following circular announces officially an appointment we have already noted; it is dated St. Paul, Minn., May 3:

"Mr. Allen Manvel has been appointed Assistant General Manager and General Superintendent of this Company, his appointment in effect from this date. He will have full charge of the operation of the line in all departments, and correspondence and reports pertaining thereto hitherto forwarded to the General Manager will from this date be sent to the Assistant General Manager. Heads of departments will consult him on all questions pertaining to force employed and to be employed, and the compensation therefor, and purchases of material and supplies, except in cases of emergency, will only be made on requisitions approved by him."

Schuylkill & Lehigh.—At the annual meeting last week the following were chosen: President, J. N. Hutchinson; directors, George F. Baer, Henry F. Eckert, J. Y. Humphrey, George De B. Keim, G. A. Nichols, George D. Stitzel; Secretary, J. Y. Humphrey; Treasurer, R. B. Kinsey.

Stockton & Amador.—The officers of this new California company are: E. S. Holden, President; F. T. Baldwin, Vice-President; B. K. Reid, Secretary; E. R. Stockwell, Treasurer. Office at Stockton, Cal.

Tennessee Railroad Commission.—The Governor of Tennessee has appointed as Railroad Commissioners under the new law O. P. Temple, of Knox; Joseph R. Dillin, of Rutherford, and John Nail, of Haywood.

Texas Western.—Frederick D. Grant, a son of ex-President Grant, is to be President of this company as reorganized.

PERSONAL.

—Mr. E. L. Guilford has resigned the position of General Freight Agent of the Peoria & Pekin Union Railway.

—Mr. W. O. Hughart, President of the Grand Rapids & Indiana Company, has taken a vacation until October next, and will spend it in Europe, sailing from Philadelphia May 14.

—Col. Thomas A. Scott is seriously ill at his residence in Philadelphia, having had a second stroke of paralysis. For several days he was in a critical condition, but is now reported better.

—Mr. Theodore Rice, Foreman of the Union Pacific shops at Green River, Wy. Ter., and formerly on the Chicago, Burlington & Quincy, died suddenly April 27 at Laramie, while on his way home.

—Mr. T. G. Gorman, late Superintendent of Machinery of the Hannibal & St. Joseph Railroad, has resigned that position and has accepted that of Superintendent of the Canadian Locomotive Works, at Kingston, Ontario.

—Mr. J. F. Sechler, Master Mechanic of the Ohio & Mississippi Railroad, who resigned in order to take a similar position at Marshall, Tex., was presented by the employés of the shops at Vincennes, Ind., with a $500 gold watch last week.

—Mr. M. F. Moon, formerly of the Locomotive Engine Safety Truck Co., has accepted the position of Chief of the Bureau of Isolated Lighting of the Edison Electric Light Co. His department includes all lights outside of cities and towns lighted by gas.

—Mr. W. B. Viall, Canadian General Agent for passenger traffic for the Central Vermont, has resigned his position owing to ill-health and the demands of his mail service contracts upon his time. He has been at Montreal about one year, having previously filled the positions of conductor and ticket agent.

TRAFFIC AND EARNINGS.

Grain Exports.

Exports from the four leading Eastern ports for the four months ending with April, have been:

	1881.	1880.	Inc. or Dec.	P. c.
New York:				
Flour, bbls	2,032,202	1,056,354	Inc. 975,848	92.4
Wheat, bush	13,606,290	13,938,854	Dec. 332,555	2.4
Corn, bush	7,504,395	11,504,368	" 3,999,973	35.9
Total, bush	30,254,603	30,196,815	Inc. 58,788	0.2
Boston:				
Flour, bbls	385,781	310,392	Inc. 75,389	24.3
Wheat, bush	891,828	1,622,589	Dec. 730,761	45.0
Corn, bush	2,785,972	4,041,600	" 1,255,628	31.0
Total, bush	5,413,814	7,060,953	Dec. 1,647,139	23.3
Philadelphia:				
Flour, bbls	93,446	72,168	Inc. 21,278	29.5
Wheat, bush	3,305,560	1,867,526	" 1,438,034	77.0
Corn, bush	2,558,042	6,567,371	Dec. 4,009,329	61.1
Total, bush	6,284,109	8,759,653	Dec. 2,475,544	23.0
Baltimore:				
Flour, bbls	174,174	146,462	Inc. 27,712	18.9
Wheat, bush	6,844,625	5,487,143	" 1,357,482	24.4
Corn, bush	5,844,248	8,279,551	Dec. 2,435,303	29.4
Total, bush	13,472,656	14,425,773	Dec. 953,117	16.6
The four ports:				
Flour, bbls	2,685,603	1,585,376	Inc. 1,100,227	69.6
Wheat, bush	24,648,312	22,916,112	" 1,732,200	7.6
Corn, bush	18,692,657	30,392,890	Dec. 11,700,233	38.5
Total, bush	55,426,182	60,443,194	Dec. 5,017,012	8.3

In the aggregate exports of the four ports there is an increase of 69.6 per cent. in flour, of 7.6 per cent. in wheat, and a decrease of 38.5 per cent. in corn, making what is equivalent to a *decrease* of 8.3 per cent. in the whole. New York's total is nearly the same as last year, Boston's 23.3 per cent., Philadelphia's 23 and Baltimore's 6.6 per cent. less. All the places have an increase in flour receipts, but of the whole increase of 1,100,227 barrels, New York has 975,848, or 88¾ per cent., and Boston 75,389, or 6⅞ per cent. In wheat there is a small decrease at New York and a large one at Boston, but an enormous gain a Philadelphia and a large one at Baltimore. All places lose largely in corn exports, which have fallen off 11,700,000 bushels, but Philadelphia has lost most, and so much that in the total exports it has a decrease of 23 per cent., in spite of its gain of 77 per cent. in wheat.

The percentages of the total exported from each place have been:

		Flour.	Wheat.	Corn.	Total.
New York	1881	75.6	55.2	40.1	54.6
	1880	66.7	60 8	37.8	50.0
Boston	1881	14.4	3.6	14.9	9.8
	1880	19.6	7.1	13.3	11.7
Philadelphia	1881	3.5	13.4	13.7	11.3
	1880	4.5	8.1	21.6	14.5
Baltimore	1881	6.5	27.8	31 2	24.3
	1880	9.2	24.0	27.3	23.8

New York gains in the proportion of the flour, and even that is exported, and in the total, but loses in wheat; Boston gains a little in corn, but loses in everything else; Philadelphia gains largely in wheat, but loses in the others and the total; Baltimore gains in wheat and corn and in the total, losing in flour.

Grain Movement.

For the week ending April 30 receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantic ports have been, in bushels, for the past eight years:

Year.	Northwestern receipts.	Northwestern shipments. Total.	By rail.	P. c. by rail.	Atlantic receipts.
1874	3,521,942	3,775,478	1,169,071	31.0	1,968,480
1875	2,735,207	2,540,262	1,075,243	42 3	2,174,067
1876	3,055,911	4,737,824	2,292,633	46.3	3,008,508
1877	3,396,193	4,521,713	1,341,677	29.7	2,196,490
1878	4,834,507	4,591,346	1,056,155	23.0	3,090,700
1879	4,297,006	4,558,360	2,931,082	64.3	4,023,227
1880	3,750,407	4,361,732	1,159,389	26.6	4,424,876
1881	4,184,871	3,778,676	3,069,926	81.3	5,181,750

The receipts of the Northwestern markets for the week were the largest since the first week of December last. Their

shipments were smaller than in the two weeks next previous, but the rail shipments were extraordinarily large, though also less than the two weeks previous. The shipments, not by rail, so far, have been by the Mississippi River. The Atlantic receipts were 21 per cent. more than the previous week, and with one exception were the largest since navigation closed.

Of the Northwestern receipts Chicago had 36 per cent., St. Louis 21.5, Peoria 17.7, Toledo 12.3, Milwaukee 6.1, Detroit 4.9, and Cleveland 1.5 per cent. Chicago's receipts are the largest it has had this year, nearly one-half larger than the week before, and the largest percentage of the total it has had since February; St. Louis' receipts are a quarter less than the week before, and the smallest it has had since March. The Peoria receipts are not only larger than in any previous week this year, but larger than in any week last year—probably the largest that have ever been received there.

Of the Atlantic receipts New York had 35 9 per cent., New Orleans 28.7, Baltimore, 14.4, Boston 11.1, Philadelphia 7.1, Portland 2, and Montreal 0.8 per cent. New York's receipts are 24 per cent. less than the week before, and with one exception are the smallest for five weeks. New Orleans has much the largest receipts it has ever had—larger than the aggregate of the three weeks previous.

The exports of the Atlantic ports for five successive weeks this year and last have been:

	May 4.	Apr. 27.	Apr. 20.	Apr. 13.	Apr. 6.
Flour, (1881—	104,271	118,901	138,759	88,524	120,665
bbls. (1880—	96 391	75,479	91,014	59,917	58,606
Grain, (1881 —2,397,558	3,117,793	3,528.623	4,099,384	4,422,442
bus. (1880—3,665,175	4,210,038	4,748,482	4,386,368	5,299,033

For the eight weeks ending May 4, exports this year and last have been:

	1881.	1880.	Inc. or Dec.	P. c.
Flour, bbls	958,246	533,379	Inc. 424,867	19.6
Grain, bush	29,644,117	35,479,472	Dec. 5,835,355	16.4

The increase in flour is equivalent to 1,911,901 bushels of wheat, and including that there has been for the eight weeks a decrease of 3,923,454 bushels, or a little more than 10 per cent.

For the week ending May 6, receipts at the four leading Atlantic ports were:

	1881.	1880.	Inc. or Dec.	P.c.
New York	1,452.475	1,272,026	Inc. 180,449	14.2
Boston	457,135	425,208	" 31,927	7 5
Philadelphia	278,400	603,800	Dec. 325,400	53.9
Baltimore	495,771	284,529	Inc. 211,242	74.2

This a light movement everywhere.

Coal Movement.

Anthracite tonnages for the four months ending April 30 are reported as follows, the tonnage in each case being only that originating on the line to which it is credited:

	1881.	1880.	Inc. or Dec.	P. c.
Phila. & Reading	1,809,013	1,721,626	I. 87,387	5.1
Northern Central, Shamokin Div., and Summit Br. R. R	313,167	226,330	I. 86,837	38.4
Sunbury, Hazleton & Wilkesbarre	1.666	4,831	D. 3,165	65.8
Pennsylvania Canal	34.858	44,716	D. 9,858	21.9
Central of N. J., Lehigh Div	1,303,330	1,103,059	I. 200,271	18.2
Lehigh Valley	1,654,679	1,243,758	I. 410,921	33.0
Pennsylvania & N. Y	21 339	6,735	I. 14,604	218.0
Del., Lacka. & Western	1,256,898	1,084,021	I. 172,877	15.9
Del. & Hudson Canal Co	1,091,662	1,018,526	I. 73,136	7.2
Pennsylvania Coal Co	347.460	284,049	I. 63,411	22.3
State Line & Sullivan	19,868	15,041	I. 4,827	32.2
Total anthracite	7,853,940	6,752,692	I. 1,101,248	16.3

The tonnage of anthracite for the corresponding period for six years has been:

1881	7,853,940	1878	4,100,651
1880	6,752,692	1877	5,752,446
1879	7,021.164	1876	4,319,039

Anthracite tonnage for this year is extraordinarily large, even after allowing for the long and severe winter.

Anthracite tonnage of the Belvidere Division, Pennsylvania Railroad, for the four months was:

	1881.	1880.	Increase.	P. c.
Coal Port for shipment	7,179	5,850	1,329	22.6
So. Amboy for shipment	207.611	131.977	75,634	57.3
Distribution on N. J. lines	245,832	161,013	84,819	52.7
Co.'s use on N. J. lines	35,291	34,641	650	1 8
Total	495,913	333,481	162,432	48.8

Of the total this year 395,681 tons were from the Lehigh, and 100,232 tons from the Wyoming Region.

Actual tonnage of anthracite passing over the Pennsylvania & New York road for the five months of its fiscal year from Dec. 1 to April 30 was: 1881, 347,081; 1880, 268,034; increase, 79,047 tons, or 42 per cent.

Semi-bituminous tonnages reported for the four months were as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Cumberland	515,8 7	586,753	D. 70,946	12.0
Huntingd n & Broad Top	80,677	77.959	I. 2.718	3.5
East Broad Top	23 448	27,309	D. 3,861	14.1
Tyrone & Clearfield	742.744	388,755	I. 353.989	91.0
Bellefonte & Snow Shoe	28,735	26,116	I. 2.619	10 0
Total semi-bituminous	1,391,411	1,106,892	I. 284,519	25.7

Actual tonnage passing over the Huntingdon & Broad Top road for the four months was:

	1881.	1880.	Inc. or Dec.	P. c.
Broad Top coal	80,677	77,959	I. 2.718	3.5
Cumberland coal	63,426	80,034	D. 16,608	20.7
Total	144,103	157,993	D. 13,890	8.8

Shipments of Cumberland coal away from the region were:

	1881.	1880.	Decrease.	P. c.
Balt. & Ohio R. R	427,047	459,279	32,232	7.0
Bedford Div., Pa. R. R	53,278	69,635	16 357	23 4
Ches. & Ohio Canal	43,765	63.355	19,590	31.1
Total	524,090	592,269	68,179	11.5

The increase in semi-bituminous coal is entirely in Clearfield. The Cumberland region is in a very unsettled state just now.

Bituminous tonnages reported for the four months are:

	1881.	1880.	Inc. or Dec.	P c
Barclay R. R. & Coal Co	145,732	151,363	D. 5,631	3.7
Alleghany Region, Pa. R. R.	92,953	124,859	D. 31 907	25.5
Penn. & Westmoreland	277,605	391,161	D. 113,556	2 4.0
W st Pa. R R	112,636	98,783	I. 13,853	14.0
S uthw st Pa. R. R	11,120	22,455	D. 11,335	50.0
Pittsburgh Region, Pa. R. R.	216,139	169,859	I. 46,280	27.2
Total bituminous	856,185	958,481	D.102.296	10.6

There was a pretty general falling off in the bituminous trade, probably due largely to a lighter furnace demand.

Shipments of coal from the mines about Rich Hill, Mo., in April were: By Missouri Pacific, 17,981; Kansas City, Ft. Scott & Gulf, 20,520; total, 38,501 tons.

Coke tonnages reported for the four months are as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Bellefonte & Snow Shoe	2,777	215	I. 2,562	....
Allegheny Region, Pa. R. R.	33,777	22,108	I. 11,669	53.0
Penn. & Westmoreland	67,229	46,227	I. 21,002	45.6
West Pa. R. R	38,652	33,792	I. 4,860	14.3
Southwest Pa. R. R	495,548	344,581	I. 151,167	43.9
Pittsburgh Region, Pa. R. R.	205,194	183,547	I. 21,647	11.7
Total coke	843,177	630,270	I. 212,907	33.8

The coke business is steadily growing. Arrangements have already been made this spring to build over 2,000 new coke ovens in the Connellsville district.

The coal tonnage of the Pennsylvania Railroad for the four months was as follows:

	1881.	1880.	Inc. or Dec.	P.c.
Anthracite	456,894	350,760	I. 106,134	30.2
Semi-bituminous	902,458	562,647	I. 339,811	60.6
Bituminous	710,453	807,118	D. 96,665	12.0
Coke	848,177	645,398	I. 197,779	30.7
Total	2,912,982	2,365,923	I. 547,059	23.1

The tonnage of all kinds in April was 723,351 tons, against 917,318 in March, 620,155 in February and 652,158 in January.

The coal tonnage of the Chesapeake & Ohio road for March and three months ending March 31 was as follows:

	March.		Quarter.	
	18-1.	1880.	1881.	1880.
Coal	64,093	43,326	102,192	119.255
Coke	7,152	4,199	16 950	7,946
Total	71,245	47,525	179,142	127,201

March shipments were divided as follows: To Ohio River at Huntington, 17,268; local points and connecting lines, 17,207; Richmond and James River wharves, 25,751; company's use, 11,019; total, 71,245 tons.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Four months ending April 30:				
Bur., Cedar Rap. & No	$625.491	$679,465	D. $53,974	7 9
Central Pacific	6,519,907	5,001.256	I. 1,518,651	30.3
Chi. & Alton	2,033,527	2,190,502	D. 156.975	7.1
Chi. & Eastern Ill.	501,592	327,698	I. 173.894	53.1
Chi. & Gd. Trk	458,507	356,600	I. 101,907	28.3
Chi., Mil. & St. P.	3,851,000	3,274,763	I. 576.237	17.6
Chi. & Northwest.	4,837,029	4,942,613	D. 105.584	2.1
Chi., St. P., Minn. & O., East Div.	605,675	462,499	I. 143,176	31.0
St. P. & S. C. Div	301,448	423,397	D. 121.949	28.8
Cin. & Springfield	304,565	281,196	I. 23.369	8.3
Cleve., Col., Cin. & Ind	1,262,937	1,246.879	I. 16,058	1.3
Cleve., Mt. V. & Del	132,991	141,281	D. 8,290	5.9
Denver & R. G	1,456,862	586,228	I. 870,634	148.6
E. Tenn., Va. & Ga.	446,510	402,891	I. 43,619	10.8
Flint & Pere Mar.	583,371	505,769	I. 77,602	15.4
Gt. Western	1,727,925	1,557,966	I. 169,959	10.9
Houston & Tex. Cent	1,280.487	1,077,384	I. 203,103	18.8
Ill. Cent., Ill. lines.	1,817,913	1,826,822	D. 8,909	0.5
Iowa lines	443,868	530,357	D. 86,489	16.3
Int. & Gt. No	798,050	525,670	I. 272 380	51.8
Lake Erie & West.	387,233	261,775	I. 125,458	47.9
Louisville & Nash.	3,414,583	2,425,966	I. 988,617	40.7
Memphis & Ch	421,942	381,607	I. 40,335	10.6
Mil., L. S. & West.	148,234	126,203	I. 22,031	17.5
Mobile & Ohio	831,415	76 ,603	I. 68,812	9.0
N. Y. & New Eng.	787,131	677,673	I. 109,458	16.1
Northern Pacific	565,684	464,082	I. 101,602	21.9
Peoria, Dec. & Ev.	170.750	98,268	I. 72,482	73.9
St. L., A. & T. H., Main Line	489,597	427,862	I. 61,735	14.4
Belleville Line	249,064	213,470	I. 35,594	16.7
St. L., Iron Mt. & So	2,370,694	1,905,979	I. 464,714	24.4
St. L. & San. Fran.	918,017	767,311	I. 150,706	19.6
St. P., Minn. & Man	1,160,316	912,695	I. 247,621	27.1
Scioto Valley	99,852	90,740	I. 9,112	10.1
Texas & Pacific	1,116,741	854,197	I. 262,544	30.7
Wabash, St. L. & P	3,773,612	4,079,805	D. 306,193	7.5
Three months ending March 31:				
Richmond & Danville	$522,708	$475,615	I. $47,093	9.9
Month of March:				
N. Y. & New Eng.	$212,018	.....	.....	.....
Net earnings	44,364	.....	.....	.....
Richmond & Danville	203,958	165,012	I. 38,973	23.6
Month of April:				
Bur., Cedar Rap. & No	$184,680	$141,652	I. $43,028	30.3
Central Pacific	1,874,000	1,356,716	I. 517,284	37.4
Chi. & Alton	548,675	542,961	I. 5,741	1.1
Chi. & Eastern Ill.	135,764	83,689	I. 52,075	62.0
Chi., Mil. & St. P.	1,260,000	871,041	I. 388,959	44.6
Chi. & Northwest.	1,454,361	1,294,573	I. 159,788	12.3
Chi., St. P., Minn. & O., East. Div.	189,106	130,916	I. 58,190	44.4
St. P. & S. C. Div	64,571	128,292	D. 63.721	49.8
Cin. & Springfield	79,813	72,696	I. 7,119	9.8
Cleve., Col., Cin. & Ind	347,098	297,713	I. 49,385	16.5
Cleve., Mt. V. & Del	35,353	36,270	D. 917	2.5
Denver & R. G	433,212	164,883	I. 268,329	162.6
E. Tenn., Va. & Ga	101,649	84,451	I. 17,198	20.5
Flint & Pere M	168,520	130,740	I. 37,780	28.8
Houston & Texas Cent	267,082	247,809	I. 19,273	7.8
Ill. Cent., Ill. lines.	481,708	412,030	I. 69,678	16.9
Iowa lines	150,355	123,702	I. 26,653	21.5
Ind., Dec. & Spring	41,220	31,917	I. 9,303	29.1
Int. & Gt. No	183,484	110,318	I. 73,166	66.5
Lake Erie & West.	98,644	79,362	I. 19,282	24.4
Louisv. & Nash	846,000	563,883	I. 282,117	50.0
Memp. & Charles.	84,406	63,115	I. 21,291	33.6
Mil., L. S. & West.	43,777	30,346	I. 13,431	44.3
Mobile & Ohio	162,027	140,091	I. 21,936	15.7
N. Y. & New Eng.	212,869	179,689	I. 33,180	18.4
Northern Pacific	214,755	186,075	I. 28,680	15.4
Peo., Dec. & Ev	51,977	29,145	I. 22,832	78.7
St. L., A. & T. H., Main Line	137,886	108,434	I. 29,452	27.3
Belleville Line	56,890	47,028	I. 9,862	21.0
St. L., Iron Mt. & So	535,000	408,241	I. 126.759	31.1
St. L. & San Fran.	265,298	174,502	I. 90,796	51.9
St. P., Minn. & Man	425,685	333,014	I. 92,671	27.8
Scioto Valley	26,407	20,453	I. 5,954	29.0
Texas & Pacific	280,347	174,177	I. 106,170	61.0
Wabash, St. L. & P	1,023,482	1,028,791	D. 5,309	0.5
Three weeks in April:				
Minn. & St. Louis	$56,589	$23,296	I. $33,293	142.9
Week ending April 23:				
Grand Trunk	$216,633	$182,546	I. $34,087	18.7
First week in May:				
Northern Pacific	$56.135	$49,138	I. $6,997	14.3

Live Stock Rates.

In consequence of irregularities, long practiced, in the rates on live stock and dressed beef from the West to the East (chiefly to New England), Commissioner Fink gave notice that, beginning last Monday, the rate would be based on a gross rate of 35 cents and a net rate of 25 cents from Chicago to New York. The regular rates are 60 and 50 cents, but the rates on most of the shipments to New England have long been those announced last Monday as general. The dressed-beef rate by agreement is 60 per cent. more than the live-stock rate, the shipper furnishing ice. Thus it is reduced from 80 to 40 cents. The net rate is given to all shippers who ship by the route designated by the joint companies' agent or evener.

Announcement is made that the reduction is because of irregularities practiced, and that the roads reserve the right to restore the old rates without notice.

East-bound Rates.

The new rates as recommended by the Classification Committee of the Joint Executive Committee went into effect last Monday, May 8, and are based on $1 per 100 lbs. on first-class and 85 cents on second-class freight from Chicago to New York, instead of $1.20 and 90 cents, with the usual differences. The reduction has comparatively little effect on earnings, as these two classes form but about 1 per cent. of the east-bound traffic.

Chicago and Milwaukee Receipts.

Receipts of grain, flour and hogs at Chicago and Milwaukee for the first week in May have been, for four years:

	1878.	1879.	1880.	1881.
Chicago:				
Grain, bush	2,462,025	2,237,566	2,782,250	1,372,531
Flour, bbls	61,029	59,916	56,943	65,949
Hogs, No	73,642	94,358	141,592	100,989
Milwaukee:				
Grain, bush	888,031	516,654	316,178	252,925
Flour, bbls	57,820	38,748	41,039	45,128
Hogs, No	2,065	3,544	5,099	5,744

The Chicago grain receipts are thus but half as great this year as in the corresponding week last year, and there is but little gain in flour, instead of the increase of 80 to 100 per cent. that has been common recently. Probably this has been due in part at least to the strike of switchmen, which made it impossible to handle much freight.

California Railroad Commission.

The California Railroad Commission has been at work on a new freight tariff covering the chief articles of traffic in that state, grain, wood, wool and cattle. The tariff has not yet been made public, as it is not quite complete. It is understood that the Central and Southern Pacific consented to a reduction of about 20 per cent. in rates, and the Commission accepted the concession.

The San Francisco & North Pacific Company has filed a protest against the rates established by the Commission.

Pacific Through Freights

Shipments of through freight eastward over the Central Pacific in March were: San Francisco, 8,159 tons; interior points, 2,307 tons; total, 10,466 tons. This would give an average of about 40 cars a day for each working day in the month. Leading items of freight were 4,552 tons barley (the only California grain which is sent by rail), 567 tons beans, 429 tons salmon and 400 tons wine.

Southern Railway & Steamship Association.

The following resolution has been adopted by the Rate Committee and is published by General Commissioner Powers:

"*Resolved*, That articles intended for exhibition at the Atlanta Cotton Exposition may be taken at full rates going, and upon certificate of the Secretary of the Exposition that such articles were properly entered and exhibited, such articles may be returned free if re-shipped by original shipper to original shipping point, by the line that carrie the articles to Atlanta."

OLD AND NEW ROADS.

Arlington & Pimlico.—This road is now completed, and will be opened for business May 17. It is about four miles long from the Western Maryland at Arlington, seven miles from Baltimore, to the Pimlico race-course. It will be worked as a branch of the Western Maryland.

Atchison, Topeka & Santa Fe.—The track on this road is reported laid to Mesilla, N. M., 45 miles southward from the junction with the Deming line. This leaves about 30 miles to be built to reach El Paso.

Arrangements have been made to take up the track of the branch of the controlled Kansas City, Lawrence & Southern Kansas road from Wellington, Kan., south to Hunnewell, 18 miles. This branch was built to compete with other branches of this road, and is of no use now that the two roads are under the same management.

Baltimore & Ohio.—A branch is to be built from the Pittsburgh Division near Connellsville, Pa., to the Morrell coke works in Fayette County, about five miles. The coke from these works will be carried to the Cambria Iron Works at Johnstown over the Somerset & Cambria Branch. Three considerable bridges will be required on the new branch, over the Youghiogheny River, the Fayette County Branch and the Southwest Pennsylvania road.

This company has submitted to the city of Baltimore a proposition in relation to the city loan of 1853, which is thus explained by the Baltimore *Gazette*: "The company does not ask to be released from any of its debt, nor to have any of the security it gives the city impaired in any way. All that it does ask is to have the terms of the contract between it and the city so modified that it may cease from being compelled to lose from 15 to 20 per cent. upon every purchase of bonds it makes for the increment of the sinking fund, required under the ordinance of 1853. The case is simply this: In 1853 the city went to the company's relief with a loan of $5,000,000. This loan was made payable in 1890. To secure its liquidation at maturity—it had 37 years to run—the road was to pay the city $300,000 a year (6 per cent. on the whole loan) in interest, and the city was to hold $500,000 of the loan in trust, the interest on which, with its increments, was to be kept as a sinking fund This $30,000 a year and the interest on it were to be invested in city stocks, also to be held for the payment of the loan. The fund thus accumulated now amounts to $2,330,000. The price of city stocks has gone up so rapidly of late years, however, that now, when the road has to buy them for the sinking fund, it suffers a loss on every purchase. To buy city 6s. of 1902 to-day the company would be forced to pay $125 for each $100 worth. The annual interest on the $500,000 held in trust, which is $30,000, will only buy city stock of the par value of $24,000. The annual interest on the accumulated increment of the sinking fund, which is, say, $132,000 at present, would only pay for the par of $105,600 of city stocks. The loss on these two transactions in 1881, which the ordinance compels the company to make, would be $32,400. In equity the city is not justified in compelling the company to make any such loss, since the security is not bettered by it. In expediency, the city ought not to force a company, the fourth of the stock of which it owns, to incur any such loss. The company has already offered to pay the whole loan and the city has declined to accept the tender. The company now asks

to have its further contributions to the sinking fund suspended, and that it be allowed to pay the difference between the interest on the $2,330,000 sinking fund already held in trust by the city and the annual interest charge on $5,000,000. To secure the payment of this interest at 6 per cent. and the rest of the loan at maturity, the company will give an additional mortgage of $2,500,000. There can be no doubt of the sufficiency of the security. There can be no doubt of the equity, the expediency and the propriety of granting the favor asked by the company."

Bangor & Portland.—Work is progressing on the extension of this road to Pen Argyl, Pa., and the company expects to have it completed by August next.

During April there was shipped over this road from the quarries on the line, 7,070 squares roofing slate, 555 cases school slate and five cars undressed school slate. A considerable increase of business is expected from the new extension.

Bradford, Eldred & Cuba.—This company has filed articles of incorporation to build a narrow-gauge road from Cuba, N. Y., to the Bradford oil region.

Brunswick & Albany.—It is reported that this road has been sold to the owners of the Alabama Great Southern rood, and that they will at once extend it from Albany, Ga., to Eufaula, Ala., and probably to York, where it will connect with the Great Southern.

Central, of New Jersey.—Application has been made for a commission to condemn lands for a spur about 1½ miles long from the Newark Branch in Newark, N. J., to several large manufacturing establishments in the lower part of the city.

The *North American* says: "President Roberts, of the Pennsylvania, is reported as displaying an iron backbone, so to speak, in insisting on the requirement that the Philadelphia & Erie shall not be used as part of a line competing with the Pennsylvania's main stem. Except by parties directly interested in persuading themselves to the contrary, it is very generally believed that there is a serious hitch in the arrangement proposed by Mr. Gould for bringing his Wabash and Jersey Central systems together by the use of the Philadelphia & Erie and the Allegheny Valley's Low-Grade Division. There are not wanting those who say that the agreement will never be signed. * * President Solon Humphreys, of the Wabash, is reported as saying that if the Pennsylvania refuses to accept his terms for the use of the Philadelphia & Erie, he will turn the Pittsburgh & Western, which he is credited with having bought, into a standard gauge, connect it with the Buffalo, Pittsburgh & Western's New Castle & Franklin, by building over the gap of twelve miles between New Castle and Wurtemburg, and also over that between Stoneboro and Oil City. Thus he can get to Buffalo and also to Salamanca. * * It is worth noticing, however, amid all the theories advanced, that the Delaware, Lackawanna & Western's Buffalo extension, and the New York, Chicago & St. Louis are the only lines in actual process of construction, except the Titusville's extensions, in the neighborhood of the through line. It is not at all improbable that Mr. Gould is keeping alive all this talk of a contract with the Pennsylvania and the Reading and the Titusville merely to divert attention from his real work on the New York, Chicago & St. Louis, which is now under contract all the way from Chicago to Buffalo, and will connect at the latter point with the Lackawanna extension."

Central Vermont.—Under the decision of the Vermont Supreme Court in the Langdon case, application was recently made for the appointment of a master or masters to ascertain and report the total amount of the so-called trust debts of every description, and the disposition made of the proceeds of the trust securities. Counsel being unable to agree upon the persons to be appointed, the Chancellor, after hearing argument, reserved his decision.

Charleston & Savannah.—This company advertises for bids for the superstructure of an iron railrod bridge over the Savannah River, near Savannah, Ga.; also for completing the substructure now partly finished. The bridge will be about 1,000 ft. long, including a draw-span.

Chicago, Pekin & Southwestern.—A supplemental bill has been filed in the United States Circuit Court in Chicago against this company by the Farmers' Loan & Trust Company, trustee, to foreclose the first mortgage for $1,000,000. Judge Drummond dismissed a similar bill some time ago, holding that the bondholders had consented to an extension, which waived the default. Then a bill was filed to foreclose the second mortgage, and a decree entered, and the road advertised for sale on May 1. The day before the proposed sale an application was presented by certain stockholders to postpone the sale and set aside the decree on the ground that the second-mortgage bonds were issued without authority or consideration. After a full hearing the petition was dismissed, the Judge holding that sufficient evidence had not been produced to support the allegations. In the meantime, however, the sale had been adjourned for 30 days. The supplemental bill gives a history of the litigation, and alleges that default has been made in payments of the February interest, amounting to $35,000, due on the first mortgage. By the decree of sale under the second mortgage certain liens and debts prior even to the first mortgage were to be paid first, and it is claimed the property is not worth enough to pay the first mortgage and these floating debts. The Court is therefore asked to retain the property in its hands, to be operated as heretofore by the Receiver, and to apply the income toward paying the debts, and that a decree of foreclosure of the first mortgage may be entered, and the road sold in the usual manner. An order was granted by Judge Drummond directing an answer to be made to this supplemental bill in 30 days.

Chicago, St. Paul, Minneapolis & Omaha.—This company gives notice of its intention to issue new stock as follows: 30,400 shares common stock for new equipment and improvements on St. Paul & Sioux City Division; 450 shares preferred, and 675 shares common stock, for the purchase of the Menominee Railroad, 4½ miles long; 300 shares preferred, and 450 shares common stock, for the purchase of the Eau Claire Railroad, 3 miles; 1,600 shares preferred, and 2,400 shares common stock, for the purchase of the Black River Railroad, 16 miles; 4,000 shares preferred, and 6,000 shares common stock, for the building of an extension of 40 miles on the North Wisconsin Division; in all $635,000 preferred and $3,992,500 common stock.

Cincinnati, Hamilton & Dayton and the Cleveland, Columbus, Cincinnati & Indianapolis.—A recent dispatch from Cincinnati says: "There is a prospect of an early consolidation of the Cleveland, Columbus, Cincinnati & Indianapolis and the Cincinnati, Hamilton & Dayton railroads. A year ago three prominent officers of the former road were taken into the directory of the latter, the two lines were put on a friendly basis and to some extent the business was consolidated. Committees have since been appointed by the directories of both roads for conference as to the advantages and basis of an entire consolidation of the business of the two lines, and these committees are now at work. They have had two or three meetings and are now inspecting the lines. It is understood that both parties are favorable to a consolidation. The only difficulty is a difference of opinion as to what would be a fair basis. Mr. Devereux, of the Cleveland, Columbus, Cincinnati & Indianapolis, is said to want the stock of the two roads to go in share for share. This the Cincinnati, Hamilton & Dayton people object to for the reason that their stock has been commanding much the better figure. Those who are acquainted with the situation, however, expect to see an agreement reached and the entire business of the two lines brought under one management. Such an arrangement would cheapen the cost of operating the lines and would ultimately redound to the advantage of both."

Cincinnati, Sandusky & Cleveland.—The lease having been approved by both companies, this road passed into possession of the Indiana, Bloomington & Western Company on May 2. It will hereafter be known as the Ohio Division of that road.

Cincinnati Southern.—The stockholders of the Cincinnati Railway Company, operating this road, have voted to increase the capital stock from $2,000,000 to $5,000,000.

Conoquenessing Valley.—This company has filed articles of incorporation to build a branch of the Shenango & Allegheny road from a point near Harrisville, Pa., south by east to Butler, about 20 miles.

Creve Cœur Lake.—This road is now completed from Laclede Station on the Missouri Pacific, seven miles from St. Louis, northward to Crève Cœur Lake, which is about 1½ miles south of the Missouri River. It is 20 miles long. The company has extensive ice-houses at the lake and the road is at present used only to haul ice, but preparations are being made for an extensive excursion business in summer. It will be worked by the Missouri Pacific.

Denver & Rio Grande.—This company offers to its stockholders, until May 14, the option of taking stock and bonds in the Denver & Rio Grande Western Company, organized to build certain extensions to connect the road with the mining regions of Utah and other territories. The lines to be built will, it is estimated, cost about $6,000,000, and bonds are to be issued at the rate of $16,000 per mile. The bonds are to bear 6 per cent. interest, and $500 stock of the new company will be given as a bonus with each $1,000 bond taken at par. Stockholders have the option of taking one $1,000 bond for each 30 shares of Denver & Rio Grande stock owned by them.

Evansville Belt.—This company has been organized to build a belt road around Evansville, Ind., connecting with all the roads entering that town. It will be about 10 miles long.

Georgia.—At the annual convention in Augusta, May 11, the stockholders voted to approve the action of the board in leasing the road. The directors were requested to declare dividends of 3½ per cent. July 15 next, 2½ per cent. in October, and thereafter 2½ per cent. quarterly.

Georgia Western.—The engineers have received orders to begin work at once on the repairs of the old grade which extends from Atlanta, Ga., westward about 50 miles. It is to be part of Gen. Gordon's new line from Atlanta to Columbus, Miss., which is now being surveyed.

Indiana, Bloomington & Western.—The lease of the Cincinnati, Sandusky & Cleveland having been duly ratified, this company has taken possession and will work the road as its Ohio Division.

Work will soon be begun on the connecting line from Indianapolis, Ind., east to Springfield, O. It is intended to push it as fast as possible.

Indianapolis Belt.—This company has executed a mortgage covering all its property and franchises to secure an issue of $1,000,000 bonds, to run 30 years at 6 per cent. interest. Of these, $500,000 are to be used to cancel the Indianapolis city bonds issued in aid of the road, and the balance for improvements of road, extensions of the stock-yards and similar works.

Iron.—It is announced that this short road has been sold to the Toledo, Delphos & Burlington Company. It is 14 miles long, from the Ohio River at Ironton, and is used chiefly for carrying coal and iron ore. It will be made part of the Dayton & Southeastern road, which will reach it by an extension of 45 miles from Wellston to Centre station.

Long Island.—The stockholders of this company have voted to guarantee an issue of $1,000,000 new bonds on the leased Brooklyn & Montauk road, whereof $750,000 are to be used to take up the present bonds, and $250,000 to build an extension of 15 miles from Patchogue, N. Y., to Moriches on the Sag Harbor Branch of the Long Island road.

Louisville, New Albany & Chicago.—This company has acquired possession of the Chicago & Indianapolis Air Line, formerly the Indianapolis, Delphi & Chicago road, and will consolidate that company with its own organization. The road purchased is completed from a point on the Joliet Division of the Michigan Central to Delphi, Ind., 76 miles, connecting with the Louisville road at Bradford. An extension of six miles to the Chicago & Eastern Illinois is nearly finished, and some work has been done between Delphi and Indianapolis. When finished it will give this road a line to Chicago and a branch to Indianapolis.

Memphis & Charleston.—The *American Exchange* says: "This company intends to place $700,000 of debenture bonds with its stockholders for the purpose of improving its equipments and increasing its business capacity to meet the demand. This will permit the net earnings of the road, heretofore employed in making extraordinary improvements, to be used as a dividend to the holders of the stock."

Milwaukee, Lake Shore & Western.—This company has filed with the Secretary of State of Wisconsin notice of intention to build branches from Antigo, Wis., to a point on the Wisconsin River in Lincoln County, and from Antigo to Florence in Marietta County; also to extend the Two Rivers Branch to Sturgeon Bay in Door County.

This company gives notice that it will redeem all its equipment bonds on June 15 next. Holders are requested to present them for payment, as interest will cease from that date.

Minneapolis & St. Louis.—The organization of this company has been completed by the consolidation with it of all its leased and controlled lines, the Minneapolis & Duluth, the Minneapolis & Iowa Southern and the Ft. Dodge & Ft. Ridgley. The whole line worked is now under one organization.

Mobile & South Gulf.—This company has secured the right of way for a railroad from Mobile, Ala., to Cedar Point, on Mobile Bay, 30 miles below the city, where it is proposed to build wharves at which large vessels may load and unload directly to and from the cars, thus avoiding the expensive lighterage now necessary for all large vessels.

New Bonds.—New issues of bonds are offered in the market as follows:

Dayton & Michigan consolidated bonds are offered by the First National Bank of Cincinnati, to the amount of $1,846,000, to take up bonds of like amount which will mature July 1 next. These bonds run 30 years, bear 5 per cent. interest and are guaranteed by the Cincinnati, Hamilton & Dayton Company, which leases the road. Bids will be received until May 14 at not less than par and interest; the 7 per cent. bonds maturing July 1 will be received at 100¼ and interest in settlement for new bonds.

Michigan Central new 5 per cent. 50-year bonds, secured on the lately acquired Detroit & Bay City road, are offered by Drexel, Morgan & Co., New York. The amount of the loan is $4,000,000 and the bonds are offered at 102½ and interest.

Houston & Texas Central new consolidated 40-year 6 per cent. general mortgage bonds are offered at 102¼ and interest by John J. Cisco & Son, New York. The total amount of the loan is $18,500,000, whereof $16,823,000 are reserved to meet prior liens, leaving $1,677,000 to be sold to pay for improvements and floting debt.

Pittsburgh, Bradford & Buffalo 6 per cent. 30-year bonds are offered through the National Bank of the Republic, New York, to the amount of $800,000. The company is a consolidation of several small Pennsylvania companies, and has 43 miles of narrow-gauge road completed and 55 miles more under construction.

St. Louis, Iron Mountain & Southern consolidated 5 per cent. 50-year bonds are offered by the company. Bids for $500,000 of these bonds will be received at the office in New York until May 14.

New Orleans Pacific.—The Shreveport (La.) *Standard* of May 6 says: "We learn from Major B. H. Greene, Chief Engineer of the New Orleans Pacific Railway, that he has received instructions from the New York office to at once place a party in the field to run a line from Alexandria, on Red River, to Little Rock, Ark. The instructions will be at once carried out, and Capt. A. W. Gloster, Division Engineer, will leave to-day in charge of a party to inaugurate the work. Captain Gloster, being an expert in this line of the profession, will insure a rapid and satisfactory execution of the work. This, in conjunction with the New Orleans Pacific, will make a competitive line between New Orleans and St. Louis with the lines now in existence east of the Mississippi River. It is thought the line will pass through Monroe, and from thence to or near Pine Bluff, Ark., and on to Little Rock, connecting there with the Iron Mountain road."

New York City & Northern.—Passenger trains began to run regularly over this road May 1, in connection with the trains of the Metropolitan Elevated road. But few trains will be run at present, as there is still some work to do in ballasting the road.

Surveys have been made for a spur from the line to the village of Tarrytown. The branch will be built if parties interested will subscribe a sufficient amount.

New York, Housatonic & Northern.—The parties who bought this road at foreclosure sale have sold the property to the Housatonic Railroad Company. The only completed section is from Brookfield, Conn., to Danbury, 5½ miles, and has always been worked by the Housatonic Company.

Northern Pacific.—The Secretary of the Interior has decided that this company has the right secured to it by charter to survey and build its road across the Crow Indian reservation on the Yellowstone River, in Eastern Montana, and the Indian Agent at the Crow Agency has been instructed to permit the engineers of the company to proceed with their surveys.

Notice is given that the general first-mortgage railroad and land-grant bonds are now ready for delivery by the Central Trust Company in New York, upon surrender of the temporary receipts properly endorsed. The bonds are of the denomination of $1,000 coupon or $5,000 registered.

The Puyallup Branch of this road has recently been extended from the former terminus at Wilkeson, Wash. Ter., to Carbonado, three miles. It reaches some new coal mines.

North River.—Articles of incorporation have been filed for this company, formed by the consolidation of the North River and the Jersey City & Albany companies. It is controlled by the New York, Ontario & Western Company.

Oregon & California.—At the bondholders' meeting in Frankfort, May 5, President Villard's plan for a reorganization of the road was adopted by a vote of 5,828 to 19. Messrs. Villard, Bretherton, and R. D. Peebles were appointed trustees. Messrs. Villard, Endicott, R. B. Pullman, Horace White, W. H. Starbuck, Bretherton, and T. F. Oakes were appointed directors, with power to nominate four others. The next general meeting will be held in October.

Panama.—Several conferences have recently been held in relation to a sale of the controlling interest in this company to parties representing M. de Lesseps and the Panama Canal Company. No agreement has yet been reached.

Pennsylvania.—Notice is given that stockholders will have the privilege of subscribing at par to the stock of the company in the proportion of 12½ per cent. of the number of shares registered in their names April 30, 1881, and those entitled to a fraction of a share can subscribe for a full share. All subscriptions must be made and paid for in full prior to June 15, 1881, and no subscriptions will be received after that date. The privilege of taking new stock may be sold by any stockholder, and blank forms of allotment will be furnished upon application at the Treasurer's office in Philadelphia.

Philadelphia & Reading.—Proceedings in the Court of Common Pleas to enjoin Mr. Gowen from acting as President have been suspended until the Supreme Court takes action on the appeal from the decision of the Common Pleas declaring Mr. Bond President.

A motion has been made in the Supreme Court to quash the appeal. The Court has set Friday, May 13, for a hearing.

Pittsburgh Southern.—The Pittsburgh & West Virginia Company, lately organized in West Virginia, has been consolidated with this company. Arrangements are now being made to begin work on the extension of the road southward into West Virginia.

Providence & Springfield.—This company is negotiating with the manufacturers of Woonsocket, R. I., for the building of a branch from Primrose on its road north to Woonsocket, about six miles.

Richmond & Allegheny.—On the western end of this road trains are now running to North River, Va., 55 miles eastward from Williamson and 16 miles beyond the last point noted. The gap between the two ends of the track at North River and New Market is now 69 miles.

St. John & Maine.—Surveys have been made for the proposed connection between this road and the Intercolonial at St. John, N. B. This road now ends at Carleton on the west side of the St. John River, and the only connection is by ferry. The line proposed is 1.6 miles long, and crosses the river at the falls, near the suspension bridge, which is used for highway travel. At this point the banks are high

and rocky, well suited for foundations, and it is proposed to build a bridge 80 ft. above high water, with a single span of 485 ft. The plan advocated by the Engineer is a steel arch-truss. The chief cost of the connection will be for the bridge and for land damages.

St. Louis, Iron Mountain & Southern.—The following circular has been issued to stockholders of this company:

"The holders of a majority in interest of the capital stock of the St. Louis, Iron Mountain & Southern Railway Company having agreed with the Missouri Pacific Railway Company to sell their shares, receiving pay therefor in full-paid stock of the Missouri Pacific Railway Company at the rate of three shares of the Missouri Pacific for four shares of the Iron Mountain; and the Missouri Pacific Railway Company having agreed to make the purchase of the Iron Mountain shares on the said terms.

"Now, notice is hereby given to the holders of the capital stock of the St. Louis, Iron Mountain & Southern Railway Company that the certificates for the shares of stock in said company can be presented at the office of the Missouri Pacific Company, and the holders thereof will thereupon be entitled, conformably to the agreement aforesaid, to receive therefor full-paid stock of the Missouri Pacific Railway Company at the rate of three shares of the Missouri Pacific Railway Company for four shares of the St. Louis, Iron Mountain & Southern Railway Company, up to and including the 15th day of May, 1881."

St. Louis & San Francisco.—Contracts have been let for the grading of the Arkansas Branch from Fayetteville, Ark., to Ft. Smith.

The company has decided to build a branch about eight miles long from Joplin, Mo., to Galena, Kan., to serve local mining interests.

The contract for cutting the tunnel (1,550 ft. long) in the Boston Mountains, on the Arkansas Division, has been let to Keegan & Scully, of St. Louis, work to be finished by Jan. 1, 1882.

St. Paul, Minneapolis & Manitoba.—The St. Paul *Pioneer-Press* says: "General Manager Hill has a party of surveyors at Kindred, running a line west between the Northern Pacific and the Fargo Southwestern Branch. Messrs. Langdon & Co. have a contract to build 75 miles of this road west from Kindred, also 75 miles north from Casselton to intersect the Grand Forks Branch near Devil's Lake. Langdon & Co. also have a contract to build 75 miles north from Grand Forks, extending the Fargo line of the company, which is to be pushed to Winnipeg and become the main line. Constructing Engineer Delano will have 400 men at work on the Fargo Southwestern Branch this week.

Notice is given by the trustees that a number of the first-mortgage 7 per cent. land grant bonds have been drawn for redemption by the sinking fund. The drawn bonds are as follows, amounting to $238,100 in all.

Bonds of $100 each, 71 in number, as follows: Nos. 60, 114, 204, 225, 227, 248, 264, 318, 329, 414, 425, 442, 468, 470, 501, 524, 532, 623, 745, 746, 747, 757, 806, 859, 877, 907, 924, 928, 959, 967, 969, 981, 997, 1012, 1016, 1033, 1079, 1095, 1115, 1117, 1136, 1149, 1182, 1189, 1210, 1248, 1364, 1377, 1382, 1441, 1513, 1562, 1579, 1585, 1595, 1596, 1669, 1685, 1692, 1712, 1730, 1765, 1769, 1777, 1837, 1853, 1913, 2006, 2079, 2156 and 2186.

Bonds of $500 each, 12 in number, as follows: Nos. 17, 76, 115, 123, 132, 256, 297, 327, 331, 338, 395 and 399.

Bonds of $1,000 each, 225 in number, as follows: Nos. 18, 23, 29, 74, 140, 157, 158, 187, 195, 319, 343, 363, 423, 496, 521, 523, 526, 538, 542, 550, 552, 562, 603, 624, 647, 654, 678, 782, 786, 826, 841, 889, 922, 965, 969, 1032, 1049, 1135, 1194, 1243, 1318, 1341, 1344, 1359, 1405, 1413, 1437, 1440, 1445, 1456, 1466, 1474, 1569, 1670, 1671, 1751, 1804, 1816, 1841, 1882, 1884, 2044, 2102, 2104, 2125, 2145, 2149, 2255, 2261, 2322, 2359, 2360, 2382, 2393, 2407, 2437, 2467, 2478, 2493, 2507, 2511, 2522, 2525, 2540, 2546, 2560, 2584, 2611, 2627, 2644, 2668, 2686, 2691, 2720, 2758, 2759, 2824; 2842, 2867, 2914, 2927, 2973, 3039, 3045, 3134, 3155, 3176, 3204, 3218, 3240, 3255, 3259, 3329, 3424, 3477, 3501, 3506, 3528, 3599, 3600, 3601, 3659, 3676, 3734, 3745, 3772, 3790, 3798, 3849, 3977, 4006, 4014, 4091, 4154, 4201, 4205, 4237, 4238, 4380, 4407, 4496, 4526, 4540, 4566, 4602, 4633, 4678, 4712, 4777, 4879, 4887, 4906, 4907, 4975, 4976, 4987, 5019, 5035, 5151, 5172, 5180, 5225, 5357, 5404, 5419, 5477, 5491, 5531, 5552, 5576, 5578, 5627, 5631, 5634, 5692, 5694, 5717, 5841, 5912, 5988, 6033, 6062, 6101, 6107, 6109, 6134, 6202, 6205, 6224, 6227, 6263, 6270, 6313, 6347, 6384, 6420, 6436, 6479, 6493, 6529, 6574, 6581, 6605, 6617, 6650, 6747, 6735, 6849, 6885, 6921, 6993, 7032, 7035, 7128, 7171, 7177, 7178, 7237, 7291, 7377, 7378, 7398, 7544, 7556 and 7563.

These drawn bonds will be paid on presentation at the office of J. S. Kennedy & Co., No. 63 William street, New York, and interest on all of them will cease from July 1 next.

Santa Cruz.—This short narrow-gauge road has been sold to the owners of the Central Pacific. It extends from the town of Santa Cruz, Cal., to Watsonville on the Southern Pacific, 21½ miles. It will be changed to standard gauge and worked as a branch of the Southern Pacific.

Savannah, Florida & Western.—The following general order was issued by the General Manager April 16:

"I. The East Florida Railway Company, having leased the line of the Waycross & Florida Railroad Company between Waycross and the St. Mary's River, has made an arrangement with the Savannah, Florida & Western Railway Company, by which the latter will operate the entire line between Waycross and Jacksonville.

"II. All officers and employés of the East Florida Railway Company and of the Waycross & Florida Railway Company, will report to the proper heads of departments of this company on and after the 1st of May, prox.

"III. Until otherwise ordered trains will run from the junction into Jacksonville over the line of the Florida Central Railroad Company, and train employés will observe all rules and regulations of that Company while on that road.

"IV. The Florida Central Railroad Company will receive and deliver freight, baggage and mails, sell passage tickets and otherwise attend to the business of the transportation, freight and passage departments of the Savannah, Florida & Western Railway Company in Jacksonville.

"V. For convenience of operation, the line between Waycross and Jacksonville will be known as the Jacksonville Division, and the line between DuPont and Live Oak as the Live Oak Division."

Scioto Valley.—This week regular passenger trains began to run on the extension of this road from Portsmouth, O., up the Ohio to Ironton, 28 miles. Freight trains have been running for several weeks. From Ironton connection is made with the Chesapeake & Ohio at Ashland, some five miles higher up the river and on the Kentucky side, by a transfer boat.

Spartanburg, Union & Columbia.—A lease of this road to the Richmond & Danville Company has been concluded at a fixed rental of $50,000 a year, which will be sufficient to pay interest on the debt. The road is a branch of the Columbia & Greenville, extending from that road at Alston, S. C., to Spartanburg, 69 miles.

Springfield, Effingham & Southeastern.—It is reported that this road has been sold to a party of Eastern capitalists. It is of 3 ft. gauge and 91 miles long, from Effingham, Ill., to Switz City, Ind. It is proposed to make it part of a line from Cincinnati to Quincy.

Texas & Pacific.—The general office of this company will be removed on May 14 from No. 275 South Fourth street, Philadelphia, to No. 197 Broadway, New York.

Texas Western.—The purchasers of this road at the recent foreclosure sale have organized a company by the same name. They intend to begin work at once on an extension to Presidio del Norte, about 650 miles from Houston.

The Labor Market.—Saturday of last week the Grand Trunk trainmen living at Battle Creek, Mich., held a meeting and appointed a committee to obtain signatures to a memorial asking the managers of the road for an advance in wages.

The same day the Hannibal & St. Joseph trackmen at St. Joseph struck for an advance from $1.25 to $1.50 per day.

The strike of the yard-men and freight-house laborers in Chicago still continues, and the roads are seriously embarrassed thereby, being unable to load cars and make up freight trains. A few men are at work in the yards, but the force is insignificant as compared with the work. Latest advices say that there is a prospect of a compromise.

The brakemen of the Chicago & Northwestern held a meeting in Chicago Sunday, and resolved to ask for an increase in wages.

Toledo, Delphos & Burlington.—This company has bought the Iron Railroad, as noted elsewhere.

Work is being pushed on the extension of the main line from Kokomo, Ind., west. The Frankfort & Kokomo road, lately purchased, is to be changed soon from standard to 3 ft. gauge.

The connection between the main line and the Dayton Division has been completed by laying track from Celina, O., southward to Versailles, 24 miles. This division is now 95 miles long, from Delphos, O., to Dayton.

ANNUAL REPORTS.

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Pittsburgh, Cincinnati & St. Louis.

For the year 1880 this company worked the following lines, without change from the previous year:

P., C. & St. L., Main Line, Pittsburgh to Columbus	192.8
Cadiz Branch	8.1
Total P., C. & St. L.	200.9
Chartiers R. R	22.8
Pitts., Wheeling & Kentucky	24.0
Cincinnati & Muskingum Valley	148.4
Little Miami R. R.	195.9
Columbus, Chicago & Indiana Central	580.5
Total	1,172.5

The road owned is the main line from Pittsburgh to Newark, O., 159.8 miles, the Cadiz Branch, and one-half interest in the 33 miles from Newark to Columbus, the other half being held by the Baltimore & Ohio as lessee of the Central Ohio.

These lines are the southern group or system of the Pennsylvania lines west of Pittsburgh.

The equipment is as follows:

	P., C. & St. L.	C. & M. V.	Little Mi.	C., C. & I. C.
Locomotives	112	14	47	163
Passenger cars	42	12	35	63
Baggage, mail, etc	32	4	16	31
Freight cars	3,472	363	690	1,699
Service cars	7	....	2	....

The Chartiers and the Pittsburgh, Wheeling & Kentucky roads have no separate equipment. More freight cars are needed on all the leased lines.

The general account is as follows, condensed:

Stock, common		$2,508,000.00
" first-preferred		2,929,200.00
" second-preferred		3,000,000.00
Total stock ($45,755 per mile)		$8,437,200.00
Bonds, first-mortgage coupon	$3,717,000	
" " " registered	2,967,000	
" Steubenville & Indiana firsts	3,000,000	
" Columbus & Newark Div.	313,000	
" Second-mortgage	2,500,000	
Total bonds ($67,771 per mile)		12,497,000.00
Deferred liabilities		1,351,979.89
Current liabilities, accounts, etc		835,913.33
Balance, surplus		97,050.85
Total		$23,219,144.07
Road and equipment ($108,147 per mile)	$19,942,294.81	
Deferred assets	690,498.89	
Betterments to leased lines	706,241.11	
Securities owned	341,398.75	
Current assets, cash, etc	1,538,710.51	
		$23,219,144.07

The deferred liabilities and assets are chiefly accounts with the leased lines for supplies received, etc.

During the year $550 first-preferred and $16,950 common stock were issued in exchange for old Steubenville & Indiana stock. The first-mortgage registered bonds were increased by $266,000, of which $123,000 were issued in exchange for coupon bonds and $143,000 for Columbus & Newark Division bonds; no change was made in the total amount of funded debt.

The earnings of the Pittsburgh, Cincinnati & St. Louis proper, 200.9 miles, were as follows:

	1880.	1879.	Increase.	P. c.
Freight	$3,217,077.96	$2,643,713.92	$573,364.04	21.7
Passengers	864,419.17	760,841.09	103,578.08	13.6
Express	70,410.13	60,923.82	9,486.31	15 6
Mails	143,440.67	127,720.70	15.719.97	12.3
Rents, etc	28,058.97	9,924.23	18,134.74	183 0
Total	$4,323,406.90	$3,603,123.76	$720.283.14	20.0
Expenses	2,290,725.40	2,003,561.01	287,164.39	14.3
Net earnings	$2,032,681.50	$1,599,562.75	$433.118.75	27.1
Gross earn. per mile	21,520.19	17,935.91	3,585.28	20.0
Net earn. per mile	10,117.88	7,961.98	2,155.90	27.1
Per cent. of exps	52.98	55.61	.....	...

The earnings of this, the main trunk over which nearly all the through business of the whole system passes, are now very large. The expenses have increased less in proportion than the earnings, chiefly because rates were generally better last year than in 1879.

The income account, condensed, is as follows:

Net earnings		$2,032,681.50
Interest and hire of equipment		16,041.21
Total		$2,048,722.71
Interest on bonds	$842,479.98	
Interest on Little Miami securities	79,444.00	
Rent of Monongahela Extension	37,500.00	
Interests paid on car trusts	95,500.00	
		1,054,923 98
Balance		$993,798.73
Net earnings leased lines	$1,374,118.77	
Rentals paid	1,622,051.04	
		247,932.27
Surplus of all lines for the year		$745,866.46
Received from G. B. Roberts, trustee		3,195.00
Total		$749,061.46
Expenses on C., C. & I. C. prior to 1875	$12,873.04	
Old claims accrued in previous years	76,632.58	
Six back coupons on second-mortgage bonds	525,000.00	
Debit balance of profit and loss, Dec. 31, 1879	37,504.99	
		652,010.61
Credit balance, Dec. 31, 1880		$97,050.85

There are still three coupons, $262,500 in all, unpaid on the second-mortgage bonds (which are held by the Pennsylvania Company); these, it is expected, will be paid from the profits of the current year.

On this main line 840 tons of steel rails, 623 tons iron rails, and 85,790 new ties were laid. The yard at Newark has been rearranged and other improvements made.

Work has been begun on Gould's Tunnel, near Steubenville, O., and it is to be completed next year. It is 3,300 feet long, and will shorten the main line 2.17 miles.

The reports for the leased lines are as follows:

CHARTIERS.

The statement for the 22.8 miles of this road is as follows:

	1880.	1879.	Increase.	P. c.
Gross earnings	$93,73 .54	$84,060.51	$9,073.03	10.7
Expenses	55,841.36	54,064.01	1,777.35	3.3
Net earnings	$37,892.18	$30,596.50	$7.295.68	23.8
Hire of equipment	6,161.95	5,847.25	314.70	5.4
Net balance	$31,730.23	$24,749.25	$6,980.98	28.2
Gross earn. per mile	4,111.12	3,713.18	314.94	10.7
Per cent. of expenses	59.57	63.86	.....	....

The net balance was paid the company as rental. On this road there was a large increase in passengers and in coal. Some improvements were made in buildings and bridges, in ballasting and new sidings.

PITTSBURGH, WHEELING & KENTUCKY.

The 24 miles of this road make the following exhibit:

	1880.	1879.	Inc. or Dec.	P. c.
Gross earnings	$91,543.85	$77,598.62	I. $13,945.23	18.0
Expenses	57,917.94	44,240.05	I. 13,667.89	30.9
Net earnings	$33,625.91	$33,348.57	I. $277.34	0.8
Hire of equipment	8,063.14	7,008.62	I. 1,054.52	15.1
Net balance	$35,562.77	$26,339.95	D. $777.18	2.9
Gross earn. per mile	3,814.75	3,233.28	I. 581.47	18.0
Per cent. of exps	63.27	57.62	I. 6.25	....

There was an increase in passenger business, but a decrease in freight, on account of partial suspensions at the Wheeling iron works. Some improvements were made in buildings, bridges and ballast. The net balance was passed to the credit of the lessor company.

CINCINNATI & MUSKINGUM VALLEY.

For this road, 148.4 miles, the report is as follows:

	1880.	1881.	Inc. or Dec.	P. c.
Gross earnings	$364,703.54	$374,666.12	D. $9,962.58	2.7
Expenses	419,881.67	264,523.95	I. 55,357.72	20.9
Net earn.	$44,821.87	$110,142.17	D. $65,320.30	59.3
Interest paid	105,000.00	105,000.00	.....	....
Balance—Def.	$60,178.13	Sur. $5,142.17	.....	.....
Gross earn. per mile	2,457.57	2,524.70	D. $67.13	2.7
P. c. of exps.	87.71	70.60	I. 17.11	.....

The deficit is an advance which is a charge against future earnings. The loss was in coal and grain traffic, other business increasing. Renewals included 917 tons iron rails, 27,279 new ties, 10.3 miles ballast and 11.8 miles new fence. There were also two new bridges and other minor improvements.

LITTLE MIAMI.

For this road, 195.9 miles, the report gives the following figures:

	1880.	1879.	Inc. or Dec.	P. c.
Earnings	$1,434,506.27	$1,332,405.81	I. $102,010.46	7.7
Expenses	1,015,357.97	891,706.30	I. 123.651 67	13.9
Net earnings	$419,148.30	$440,789.51	D. $21,641.21	4.9
Dividends, interest, etc	126,594.74	113,811.22	I. 12,783.52	11.2
Total	$545,743.04	$554,600.73	D. $8,857.69	1.6
Rental	706,255.42	737,078.50	D. 30,823.08	4.2
Loss on lease	$160,512.38	$182,477.77	D. $21,965.39	12.0
Gross earn. per mile	7,322.65	6,801.92	I. 520.73	7.7
Per cent. of exps	70.78	66.92	I. 3.86	....

There was expended on betterments of road $46,892.24,

all for new depots in Cincinnati. Passenger business improved on this line, but local freight decreased. There were 2,000 tons steel rails and 33,000 ties laid; 102.2 miles of the road have now steel track. Besides the new stations in Cincinnati other improvements were made on the line. One new engine was built.

COLUMBUS, CHICAGO & INDIANA CENTRAL.

The earnings, etc., of the 580.5 miles of this road were:

	1880.	1879.	Inc. or Dec	P.c.
Earnings	$4,795,771.36	$3,911,261.28	I. $884,510.08	22.6
Expenses	4,069,510.50	3,154,960.45	I. 914,550.05	29.0
Net earnings	$726,260.86	$756,300.83	D. $30,039.97	4.0
To credit of trustees and receivers	726,260.86	756,300.83	D. 30,039.97	4.0
Gross earn. per mile	8,261.45	6,737.75	I. 1,523.70	22.6
Per ct. of exps	84.86	80.66	I. 4.20	....

The business of this road was better, but expenses were increased by large renewals and increased cost of labor and materials. There were 8,202 tons steel rails, 8,920 tons iron rails and 256,715 new ties used. Several bridges are rebuilt. Pending litigation the net earnings are paid into Court for account of the trustees and receivers.

ST. LOUIS, VANDALIA & TERRE HAUTE.

This road, in which this company owns one-half share, is not worked directly, but is leased to the Terre Haute & Indianapolis Company. The result from its 158.4 miles was as follows:

	1880.	1879.	Increase.*	P. c.
Earnings	$1,560,873.21	$1,317,286 59	$243,586.62	18.5
Expenses	1,147,094.79	954,389.53	192,705.26	20.2
Net earnings	$413,778.42	$362,897.06	$50,881.36	14.0
Rental	468,261.96	395,185,97	73,075.99	18.5
Loss	$54,483.54	$32,288.91	$22,194.63	68.7
Gross earn. per mile	9,854.00	8,316.20	1,537.80	18.5
Per cent. of exps.	73.49	72.45	1.04	....

The rental is 30 per cent. of gross earnings. One-half of the loss, being $27,241.77, is charged to the Pittsburgh, Cincinnati & St. Louis Company, as shown by the income account above. On this road trains ran 1,359,607 miles, carrying 285,954 passengers 18,038,305 miles and 1,011,079 tons of freight 97,544.525 miles; an increase of 34.63 per cent. in passenger mileage and of 5.97 per cent. in tonnage mileage.

TRAFFIC OF ALL THE LINES.

The traffic on all the lines worked directly by this company was as follows:

Passengers carried:	1880.	1879.	Inc. or Dec.	P. c.
P., C. & St. L.	902,454	778,461	I. 123,993	15.9
Chartiers	150,039	130,743	I. 19,287	14.8
P., Wh. & Ky	91,562	63,123	I. 30,439	48.2
Cin. & Mus. Valley	210,793	189,636	I. 21,157	11.2
Little Miami	888,791	835,541	I. 53,250	6.4
C., C. & I. C.	814,980	695,552	I. 119,428	17.2
Total	3,060,610	2,693,056	I. 367,554	13.7
Passenger-miles:				
P., C. & St. L.	36,303,468	31,535,558	I. 4,767,910	15.1
Chartiers	1,6 8.167	1,458,114	I. 180,053	12.4
P., Wh. & Ky	1,550,548	1,033,530	I. 517,018	50.0
C. & M. V.	4,356,261	4,067,077	I. 289,184	7.1
Little Miami	23,093,029	20,456,940	I. 2,636,089	12.9
C., C. & I. C.	41,432,531	33,967.484	I. 7,465,047	21.9
Total	108,374,004	92,518,703	I. 15,855,301	17.1
Tons freight carried:				
P., C. & St. L.	3,099,994	2,726,847	I. 373.147	13.7
Chartiers	,218,258	167,571	I. 50,687	30.3
P., Wh. & Ky	107,695	121,808	D. 14,113	11.6
C. & M. V.	259,057	285,784	D. 26,727	9.4
Little Miami	782,495	787,769	D. 5,274	0.7
C., C. & I. C.	2,484,321	2,310,053	I. 174,268	7.5
Total	6,951,820	6,399,832	I. 551,988	8.6
Ton-miles:				
P., C. & St. L.	385,153,890	367,377,011	I. 17,776,879	4.8
Chartiers	1,270,692	1,206,430	I. 64,262	5.3
P., Wh. & Ky	2,345,315	2,650,644	D. 305,329	11.5
C. & M. V.	13,816,861	17,926,938	D. 4,110,077	22.9
Little Miami	63,434,183	64,425,652	D. 991,469	1.5
C., C. & I. C.	441,353,949	402,856,462	I. 38,497,487	9.6
Total	907,374,890	856,443,137	I. 50,931,753	5.9

The average receipts and expenses per unit of traffic on all these lines was as follows, in cents:

	Pass.-mile.			Ton-mile.		
	Rec't.	Cost.	Net.	Rec't.	Cost.	Net.
P., C. & St L.	2.380	1.630	0.750	0.840	0.440	0.400
Chartiers	3.000	2.130	0.870	3.220	1.650	1.570
P., Wh. & Ky.	2.620	1.930	0.690	2.030	1.190	0.840
C. & M. V.	2.630	3.430	*0.800	1.640	1.230	0.410
Little Miami	2.200	1.930	0.270	1.220	0.900	0.320
C., C. & I. C.	2.430	2.370	0.060	0.800	0.700	0.100

*Loss.

On the Pittsburgh, Cincinnati & St. Louis the average rate per ton-mile in 1879 was 0.720 cent gross and 0.300 cent net; on the Little Miami it was 1.140 cent gross and 0.370 net; on the Columbus, Chicago & Indiana Central it was 0.700 cent gross and 0.110 cent net.

Some figures for train and car mileage taken from the very complete tables in the report of Mr. Thomas D. Messler, Comptroller and Assistant to the President, are as follows:

	Train miles.	Car miles. Pass.	Freight.	Av. train-load. Pass.	Fr't.
P., C. & St. L.	3,131,473	4,147,586	41,717,728	55.79	191.34
Chartiers	81,114	167,187	210,581	32 89	58.77
P., Wh. & Ky.	88,288	167,456	400,377	29 52	132.44
Cin. & M. V.	393,185	599,601	2,364,794	20.54	101.02
Little Miami	1,271,205	2,520,924	9,149,544	42.90	132.67
C., C. & I. C.	4,961,025	5,062,357	55,682,615	36.63	151.47
Total	9,926,290	12,665,111	112,525,689	.....	.....

On the Pittsburgh, Cincinnati & St. Louis the average earnings per train mile were 162 31 cents gross and 76.31 cents net; on the Little Miami, 141.12 cents gross and 41.23 cents net; on the Columbus, Chicago & Indiana Central, 118.53 cents gross and 17.95 cents net.

Average passenger rates increased on all the lines except the Cincinnati & Muskingum Valley. In consequence, however, of increased cost of labor and materials, the net rates decreased except on the main line and the Chartiers road.

GENERAL REMARKS.

The report says: "It will be noted that your properties have not only been fully maintained, but have improved in condition during the previous year; the steady growth of their traffic, however, requires a continual increase of the facilities for handling the same. There were laid during 1880 upon the lines covered by the report 12,017 tons of steel and 12,825 tons of iron rails. * * *

"No change has taken place in the condition of the litigation between your company and the Columbus, Chicago & Indiana Central Company, although several efforts were made to effect a compromise thereof. Recent changes in the ownership of the securities of that company have occurred, under which their control has passed largely into the hands of a few parties, who have evinced a desire to reach an amicable settlement of the matters in dispute. It is hoped that this may be consummated in such a manner that your interests will be properly protected. * * *

"The thanks of the board are due and are hereby tendered to the officers and employés of the company for the fidelity and ability with which they have discharged the duties entrusted to them during the past year."

Michigan Central.

The report for the year 1880 was submitted at the annual meeting in Detroit, May 5.

There was no change in the mileage of road worked during the year, which was 803.72 miles, as follows:

	Miles.
Main line, Detroit to Chicago (including 14 miles, used jointly with Illinois Central)	284.00
Air Line	103.60
Joliet & Northern Indiana	45.00
Grand River Valley Division	84.00
Jackson, Lansing & Saginaw Division	236.00
Kalamazoo & South Haven Division	40.00
Niles & South Bend Branch	11.12
Total	803.72

The mileage of track at the end of the last two years was:

	1880.	1879.
Miles of road	803.72	803.72
Miles of second track	85.50	77.83
Miles of sidings	241.72	230.96
Total miles of track	1,130.94	1,112.51

This is an increase of 18.43 miles of track, 7.67 miles of which were secured track and 10.76 miles new sidings. The 14 miles from Chicago to Kensington, which forms part of this company's main line is neither owned nor maintained by it, but by the Illinois Central.

At the close of 1880, 590.82 miles of these tracks were laid with steel, which is 51.31 miles more than at its beginning. The stock of engines was increased from 278 to 283, and there were additions to the stock of cars amounting to 875, all freight cars. At the close of the year this stock amounted to 76 first-class, 24 second-class and 3 dining cars; 10 combination, passenger and baggage cars; 37 baggage, mail and postal cars; 137 way (freight conductors') cars; 494 stock, 3,800 8-wheel and 250 4-wheel box-cars, 1,382 platform and coal cars, and 7 service cars (paymasters', derrick, etc.), making 6,220 in all, or an average of 7¾ cars per mile of road worked and 22 per locomotive.

The balance sheet shows the following assets and liabilities:

Assets.

Construction account	$28,709,731.67
" leased lines	5, 41,278.33
Equipment bond trustees	545,245.82
	$34.396,255.82
Investments	489,786.99
Detroit & Bay City Railroad	340,171.78
Fuel and supplies	411,618.49
Bills receivable	58,940.44
Accounts receivable	503,629.92
Cash	755,362.46
Total	$36,955,365.90

Liabilities.

Capital stock		$18,738,204.00
Funded debt		13,691,000.00
Accounts payable		1,200,849.16
Income account:		
To Dec. 31, 1878	$3,019,347.81	
From Jan. 1, 1879	305,964.93	
		3,325,312.74
Total		$36,955,365.90

Compared with the balance sheet of the previous year there is an increase in assets of nearly $262,000 in the construction account of line owned, and of $10,000 in lines leased; a decrease of $175,000 in investments; and increase of $17,000 in Detroit & Bay City road; and increase of $174,000 in fuel and supplies; an increase of the whole amount ($503,620) of accounts receivable; and an increase of $619,000 in the cash. In the liabilities there is no change in stock or funded debt, and only the increase in the credit to income account. But $739,500 of the bonds have been purchased and are held in the sinking fund, a gain of $23,000 during the year.

The work done during the year was:

	1880.	1879.	Inc. or Dec.	P. c.
Locomotive miles:				
Passenger	1,865,258	1,693,098	I. 172,160	10.2
Freight	3,658,605	3,687,305	D. 28,700	0.8
Miscellaneous	241,023	226,651	I. 14,372	6.3
Switching	1,925,181	2,090,007	D. 164,826	7.9
Total	7,690,067	7,697,061	D. 6,994	0.1
Traffic:				
Tons hauled	3,797,137	3,513,819	I. 283,318	8.0
Ton miles	735,611,995	721,019,413	I. 14,592,582	2.0
Passengers carried	1,699,810	1,445,655	I. 254,155	17.6
Passenger miles	115,523,789	93,232,430	I. 22,291,359	24.0
Passengers:				
Through—No. east	77,447	58,013	I. 19,434	33.4
Mileage	21,994,948	16,475,692	I. 5,519,256	33.4
Through—No. west	65,892	52,513	I. 13,379	25.4
Mileage	18,713,328	14,913,692	I. 3,799,636	25.4
Through—Emigrant	79,052	75,531	I. 23,521	42.4
Mileage	22,450,768	15,770,804	I. 6,679,964	43.4
Through—Total No.	222.391	166,057	I. 56,334	34.0
Mileage	62,159,044	47,160,188	I. 15,998,856	34.0
Local—No.	1,477,419	1,279,598	I. 197,821	15.5
Mileage	52,364,745	46,072,242	I. 6,292,503	13.6

It appears thus that this year the through passenger traffic was 54.7 per cent. of the whole, against 50.6 per cent. last year, and that of the total *increase* in passenger traffic 71.7 per cent. was through and 30 per cent. emigrant traffic. The emigrant traffic (all west-bound) was larger by 20 per cent. than all the rest of the west-bound through traffic, and what is really astonishing is that aside from emigrant traffic there were nearly one fifth more through passengers east than west, though the movement of population is decidedly westward. The increase in local passenger traffic (which is substantially equal in the two directions) was very large, though so much less than the increase in through travel.

Freight:

	1880.	1879.	Inc. or Dec.	P.c.
Through east, tons	1,323,614	1,433,000	D. 109,386	7.8
Ton miles	357,273,540	387,015,495	D. 29,741,955	7.8
Through west, tons	601,812	605,124	D. 3,312	0.5
Ton miles	167,175,440	168,031,830	D. 852,390	0.5
Through total, tons	1,925,426	2,038,124	D. 112,698	5.5
Ton miles	524,452,980	558,047,325	D. 30,594,345	5.5
Local, tons	1,871,711	1,475,695	I. 396,016	27.0
Ton miles	211,159,015	165,972,088	I. 45,186,927	27.2

Thus there was a decrease of 7¾ per cent. in through freight east and of ½ per cent. in through freight west, and the small increase of 2 per cent. in the total freight movement was wholly due to an increase of 27.2 per cent. in local freight.

Average passenger trains.	1880.	1879.	Inc. or Dec.	P. c.
No. cars	5.54	5.02	I. 0.52	10.3
No. passengers	61.95	55.07	I. 6.88	12.5
Average freight trains.				
No. cars	24.16	23.97	I. 0.19	0.8
No. tons freight	201.07	195.54	I. 5.53	3.0

The earnings and expenses were:

Earnings.	1880.	1879.	Inc. or Dec.	P. c.
Freight	$6,195,970.72	$4,986,987.84	I. $1,208,982.88	24.2
Passengers	2,461,771.31	2,062,264.51	I. 399,506.80	19.0
Mail	103,418.73	96,444.50	I. 6,974.23	7.2
Express	121,564.20	129,133. 3	D. 7,569.03	5.8
Miscellaneous	68,650.08	71,964.26	D. 3,314.18	4.6
Total	$8,951,375.04	$7,346,794.34	I. $1,004,580.70	21.8
Expenses	5,541,495.57	4,497,910.67	I. 1,043,584.90	23.2
Taxes	197,255.52	201,681.76	D. 4,426.24	2.2
Exp. & taxes	$5,738,751.09	$4,699,592.43	I. $1,039,158.66	22.1
P. C. of earn.	64.11	63.97		
Net earnings	3,212,623.95	2,647,201.91	565,422.04	21.4

There is an increase in nearly every item of working expenses, and in some the increase is very large, and in none more so than in maintenance of road and structures—the percentage of increase being 18 per cent. in road repairs, 75 in bridge repairs, 100 in fence repairs. 200 in building repairs, 70 in water works repairs, but only 2½ in locomotive and 11 per cent. in car repairs, and 13.7 in fuel. The largest amount of increase in a single item is $236,788, or 91 per cent., for car-hire.

The course of rates for four years is shown below, in cents:

Per passenger per mile:	1880.	1879.	1878.	1877.
Through east	2.04	2.12	2 31	2.08
" west	2.10	2. 3	2.28	2.10
Emigrant	1.05	1.09	1.05	0.96
Total through	1.71	1.81	2.04	2.09
Local	2.64	2.62	2.74	2.77
Total through and local	2.13	2.21	2.41	2.36
Per ton of freight per mile:				
Through east	0.719	0.515	0.599	0.762
" west	0.494	0.441	0.548	0.605
Total through	0.648	0.493	0.589	0.702
Local	1.326	1.356	1.679	1.845
Total through and local	0.842	0.692	0.848	0.982

The disposition of the income was as follows:

Income:		
Net earnings		$3,212,623.95
Revenue from investments		134,373.67
Total		$3,346,997.62
Interest, Main Line	$765,520.00	
" leased lines	619,599.58	
Rental, leased lines	184,310.00	
Jackson accident	70,000.00	
		1,639,429.58
Surplus over charges		$1,707,568.04
Dividends (8 per cent)		1,499,056.32
Balance from 1880		$208,511.72
" " 1879		97,453.21
Total balance		$305,964.93

The following are extracts from the report of President W. H. Vanderbilt:

"As anticipated in our previous report, the condition of the property has been much improved, and the results of the year in that respect are very gratifying. The improvement is marked in the roadway and track, bridges, buildings, station grounds and rolling stock, for which there has been expended, in excess of the amount necessary for actual maintenance, say $750,000, the particulars of which are fully detailed in the General Manager's report herewith.

"The business of the year was the most successful in the history of the company, the particular features of which are the largely increased volume of traffic, the considerable and permanent improvement of the property, and the resulting dividend of 8 per cent. paid to the shareholders.

"The operating expenses show an increase in their per cent. to earnings, viz.: from 63.97 to 64.11, or fourteen-hundredths of 1 per cent., which is small, in view of the fact that for the improvement of the property there was charged to expenses, say $600,000, which could very properly have been charged to construction account. Had this amount been so charged, the operating expenses would have been but 57.41 per cent., or a reduction of 6.56 per cent. from last year.

"*Construction.*—This account, for the entire system, has increased during the year, as stated in the General Manager's report, $271,109, of which amount the cost of lands and new second track, viz., $95,184, was paid with funds derived from traffic; but the cost of 227 new freight cars, viz., $175,925, was paid with proceeds of sundry securities which the company had theretofore held.

* * * * * * *

"The report of the Trustees of the sinking funds occupies its usual place herein, and the fact that these funds were established to provide for the redemption of the 8 per cent. bonds of the company, maturing Oct 1, 1882, makes their reports of annually increasing importance.

"Attention is invited to the report of the Land Commissioner of the Jackson, Lansing & Saginaw land grant. It is of more than ordinary interest, as it shows the increasing prosperity and development of the northern portion of the Lower Peninsula, and indicates the rapid reduction of the mortgage debt on the Jackson, Lansing & Saginaw road.

"Especial attention is invited to the report of the General Manager in respect to the extension of the Jackson, Lansing & Saginaw line to the Straits of Mackinaw, which, it is expected, will be completed early in the autumn of 1881, and the advantages to be derived therefrom by a connection with the Marquette & Mackinac road, now building.

"The excellent condition of the company's property, and the successful operations of the year, are largely due to the faithful labor of the General Manager and his efficient assistants."

General Manager H. B. Ledyard reports in detail the more important repairs and construction of the year. The only charges to construction account were $40,184 for land at Detroit and Grand Rapids, $55,000 for six miles of second track from Jackson to Leoni, and $175,925 for 227 of the 900 new freight cars.

Mr. Ledyard says: "Arrangements for the extension of the Jackson, Lansing & Saginaw Railroad to the Straits of Mackinaw were concluded in the month of November. It is expected that this extension will be open for traffic next fall, about the time the road now building from Marquette to Mackinaw will be completed, which may, in the future, afford an important connection with the Northern Pacific road.

"This extension, in addition to materially increasing the traffic of that branch of the road, will, it is believed, be of benefit in opening up for settlement lands which the company has for sale."